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TRANSFORMATION OF THE INTESTINAL FLORA*

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This is quite an old subject, which has recently received new interest. As long ago as 1868, Senator[1] put forth the idea that decomposition of protein within the alimentary canal under ordinary conditions results in the formation of substances that are toxic to the host. About twenty years later Bouchard[2] elaborated the theory of intestinal intoxication and claimed that the amount of putrefactive products eliminated in the urine was a measure of the degree of intestinal putrefaction. The idea of intestinal auto-intoxication became more and more popular toward the beginning of the present century and many diseases and conditions were treated with the idea of overcoming intestinal putrefaction. Intestinal antiseptics of many different kinds were employed.

Although enthusiasts here and there thought they saw wonderful results in many different diseases and conditions, as a matter of fact, the closer observers were never able to see anything more than indifferent or doubtful effects from the intestinal antiseptic therapy.

Not only were various diseases and abnormal conditions supposed to be caused by the absorption of toxins, the products of putrefaction in the intestinal canal, but aging of tissue or premature senescence was also supposed to be due to the same cause. In 1907, there appeared a book by Elie Metchnikoff,[3] "Prolongation of Life." Metchnikoff not only supported the belief that premature senescence or old age was the result of toxins produced in the intestinal canal by harmful bacteria, but he endorsed and popularized the theory that these bacteria could be crowded out, as it were, by deliberate ingestion of cultures of harmless bacteria. He further believed that such change in the intestinal flora, if maintained, would prevent premature aging of the tissues and thereby prolong life. This was a beautiful and most plausible theory and met with ready acceptance.

In looking for a suitable germ to introduce into the intestinal canal to take the place of the theoretically harmful bacteria, Metchnikoff turned to Bulgaria, where the people are famously long lived and where they subsist largely upon milk and milk products. He believed that the predominating germ in milk in that country would be likely to be the proper one to employ for this purpose. It was found that certain lactic acid-producing, or milk-souring, germs constituted most of the bacteria taken in with their food by the Bulgarians and the group of organisms known as Bacillus bulgaricus was selected. Metchnikoff's implicit faith in his theory is shown by the fact that from that time on throughout the remaining years of his life he prepared and drank milk soured with his selected strains of B. bulgaricus. His

*Oration on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

belief never waned, but he died of senility, the very condition he sought to prevent, at the age of 72. It should be said, however, that the condition was recognized to be in an advanced stage even before he ever began the use of his sour milk cultures of B. bulgaricus. On his seventieth birthday, Metchnikoff[4] wrote:

"When macrobiotics become more perfect, when people have learnt how to cultivate a suitable flora in the intestines of children as soon as they are weaned from their mother's breast, the normal limit of life will be put much further back and may extend to twice my 70 years."

After the appearance of the eagerly read book upon prolongation of life, there followed an ever-increasing wave of enthusiastic use of B. bulgaricus for therapeutic purposes and also in the form of sour milk as a food beverage. Commercial interests soon seized upon the opportunity to exploit the all-too-gullible medical profession and through them the still more helpless public. All kinds of preparations of B. bulgaricus were put upon the market in the form of tablets, capsules and liquid and under many trade names. The use grew and grew until "B. B." therapy was employed at some time or other and to a greater or less extent by almost all physicians. Although no doubt there has been some decline in the use of this perfectly worthless or ineffective remedy during the last few years, the writer is told that some of the popular producers still find the capacities of their factories taxed to the limit to supply the demand.

B. bulgaricus cultures are given with the expectation that they will live, grow and multiply in the intestinal canal (or wherever introduced) and thereby replace or crowd out other harmful bacteria. They are not supposed to have any other beneficial effect, and unless they do this they have no therapeutic value. Let us see what the facts are.

During the first few years of B. bulgaricus therapy several investigators reported that they had been able to demonstrate B. bulgaricus in the feces of persons who had drunk milk fermented with this organism. Later work seems to have shown conclusively that these earlier observations were incorrect and that B. bulgaricus cannot survive in the intestinal canal.

Herter and Kendall,[5] in 1908, were the first to demonstrate the fact that B. bulgaricus cannot grow and be colonized in the intestinal canal. They fed to a monkey milk fermented with B. bulgaricus, and found that the organism did not survive below the ileocecal valve. Since that time many other investigators have obtained similar results.

Rettger and Cheplin[6] have recently more thoroughly investigated the possibilities of establishing B. bulgaricus in the intestinal canal of both white rats and man and have definitely proved that it cannot be done. They fed rats as much as 5 c. c. daily of a culture of B. bulgaricus and in no instance could the organism be found in the feces. In nine rats that had been fed on cultures of B. bulgaricus in large amounts for a period of seven days, autopsies were performed and cultures were made from different parts of the alimentary tract twenty-four hours after the last feeding. The organism was not found in any instance, showing conclusively that it rapidly dies out in the alimentary canal of the rat.

Again, they tried to implant B. bulgaricus in man by feeding large quantities of the milk culture over considerable periods of time. In no instance could a single B. bulgaricus be isolated from the feces. Therefore, it seems to be definitely proven that B. bulgaricus cannot be colonized in the intestinal canal of man or animal.

Regardless of the reports of the experimental work of one investigator after another that have appeared in the literature during the past several years, all showing that B. bulgaricus cannot be propagated in the alimentary canal, the use of it as a therapeutic agent has continued to grow. Producers who were able to popularize their special strains and brands have been able to make fortunes which have come out of our patients' pockets as a result of our disregard for the established facts. And today these worthless preparations are being prescribed to thousands upon thousands of our patients. There is one redeeming feature, however, and that is that they are harmless except in so far as they lead to neglect of effective therapy. It should be said also, that although B. bulgaricus, as such, does not change the intestinal flora, milk soured with this organism is a pleasant and healthful food beverage.

The failure of B. bulgaricus to live and grow in the intestinal canal and thereby replace supposedly harmful bacteria does not for a moment disprove the theory of intestinal auto-intoxication nor the theory that it can be controlled by replacing the harmful with harmless bacteria. Perhaps if other more successful means of changing the intestinal flora were employed, the results might be entirely different. Let us now turn to a consideration of certain more promising means of simplyfying the intestinal flora and reducing the growth of toxin-producing bacteria in the intestinal canal. Let us first see how the intestinal flora behaves in Nature and what influences are responsible for the changes that take place.

The intestinal canal is an ideal culture tube. All that is necessary is that food substances shall be introduced to provide sustenance for the bacteria. Some of our foods are more favorable culture media for certain bacteria and others for other kinds. Some bacteria thrive best in media containing large amounts of carbohydrates. These are fermentative bacteria. Others thrive best in media containing large amounts of animal protein. These are putrefactive or proteolytic bacteria and it is the products of their proteolytic action that are toxic and are supposed to be the cause of the diseases and conditions which we seek to prevent by transformation of the intestinal flora. These proteolytic toxin-producing bacteria usually give rise to alkaline reaction of the media in which they grow and it is to them that the usual alkaline reaction of the feces of the adult is due. It is interesting in this connection that under experimental conditions at least, the colon-typhoid group of organisms, which are the predominating bacteria in the colon of most adults, are capable of producing arteriosclerosis. Klotz[7] claimed that by injecting cultures of typhoid bacilli into rabbits he could produce arteriosclerosis, the lesions of which resemble histologically the lesions seen in old age. However, this was only one of the many toxins which he found would produce the same condition. It is quite likely that the toxins of other bacteria, including no doubt other types found in the colon, might produce similar conditions under experimental conditions. Plausible as it seems, this experimental production of arteriosclerosis in experimental animals by injecting cultures and the toxins of some of the predominating types of proteolytic bacteria in the intestinal canal does not prove that absorption of bacterial toxins from the intestinal canal (colon chiefly) causes the condition in man. It remains at present only a theory and one of the important problems before us is to determine what disease or abnormal condition, if any, is produced in this way.

There is still another type of bacteria that predominates in the intestinal flora during infancy and the first year or two of childhood under normal conditions, provided the individuals are healthy. These bacteria grow well in milk and produce acids, chiefly lactic acid, and thereby give to the contents of the colon and the feces of infants and very young children the normal acid reaction. These acid producing bacteria are called aciduric bacteria.

The meconium of the new born baby is sterile. If it be breast fed exclusively, there is established in a few days a very simple flora consisting chiefly or almost entirely of Bacillus bifidus. This was first shown by Tissier,[8] a French medical student, in 1900. This B. bifidus lives, grows and multiplies chiefly if not entirely in the colon so that the feces contain almost pure cultures of the organism. B. bifidus is an anaerobic bacterium and, therefore, grows well in breast milk and its digestion products in the intestine. Favorable conditions for growth of anaerobic bacteria result from the breast milk's being drawn directly by the baby and swallowed with the minimum exposure to or admixture with air. This predominance of B. bifidus in the intestinal flora continues as long as the baby is breast fed only.

There is, however, to be found in the intestinal flora of nurslings a variable and frequently quite considerable proportion of another acid producing or aciduric organism, Bacillus acidophilus, described by Moro,[9] in 1900. Moro first claimed that B. acidophilus was the predominating organism in the intestinal flora of nurslings, but later acknowledged the claim of Tissier that B. bifidus is the predominating organism. He explained his error by the fact that he had not adequately employed anaerobic cultural conditions, which are

necessary for the demonstration of B. bifidus. This led him to the erroneous conclusion that B. acidophilus was the predominating organism, whereas, in fact, although present in large numbers, it is less numerous than B. bifidus.

As soon as the child begins to be fed other food in considerable quantities, the B. acidophilus becomes much more numerous and B. bifidus much less numerous. Usually by the time breast feeding is discontinued the flora consists almost entirely of B. acidophilus with only a small proportion of B. bifidus. These conditions, of course, exist only under normal or healthy conditions in the intestinal canal.

During the next year or two following discontinuation of breast feeding, B. acidophilus remains the predominating organism but as the individual grows older the intestinal flora becomes more and more complex until long before adult age is reached the simple aciduric flora consisting chiefly of B. acidophilus gives way to a great variety of other types that become established, this varying greatly with different individuals. A few acidophilus bacilli can usually be demonstrated in the intestinal flora of supposedly normal adults at any age. They usually constitute from none up to five or six per cent of the viable bacteria present. The simple aciduric bacteria, consisting chiefly of B. bifidus and B. acidophilus in early life, have been entirely overshadowed by the many other different types which become established from time to time, many of which are proteolytic toxin and gas producing organisms. It is these which are supposed to exert harmful influences through the toxin which they produce and which it was Metchnikoff's object to replace by harmless bacteria. Many of the species present in the digestive tract and that may be isolated from the feces, if they are inoculated in pure culture in vitro into culture media containing the usual food proteins particularly, cause putrefaction of the food, usually with production of gas and toxic substances. The toxicity of some of these products of these proteolytic bacteria is easily demonstrated by feeding or injecting them into experimental animals. Although small quantities may not produce any definite effect, larger quantities may even produce death. There is no question, therefore, that they produce toxins. Whether such toxins are absorbed from the intestinal canal and do harm is quite a different question.

Perhaps the most frequently predominating proteolytic organism in the intestinal flora of adults is the colon bacillus. Reduction in the number of colon bacilli or its disappearance entirely has been considered by some to be a reliable guide as to the effect of measures directed toward control of intestinal intoxication. The colon-acidophilus ratio has been employed by Cannon[10] as a means of expressing the results of measures directed toward prevention of putrefaction in the intestinal canal. The idea is that the larger the number of B. acidophilus which can be maintained, approaching if not equalling the condition which exists in infancy and early childhood, the less other bacteria will be present and, therefore, the less proteolysis will occur, with its resulting toxin production. It is assumed by those who advocate this therapy that B. acidophilus is harmless and, therefore, maintaining it to the exclusion of other bacteria would prevent the harmful effects supposed to result from the presence in large numbers of proteolytic bacteria. It is the same idea that Metchnikoff had, except that B. acidophilus, a normal inhabitant of the intestinal canal and the predominating organism at a certain period of early life in most normal individuals, is used instead of the B. bulgaricus which he selected and which, as has been pointed out, cannot survive in the intestinal canal. Let us now consider available means of maintaining B. acidophilus as the predominating organism in the intestinal flora.

Diet has a most profound influence upon the intestinal flora. We have already seen how the flora is altered by changes in diet in early life. When a child is breast fed B. bifidus predominates with B. acidophilus secondary. When other feeding is added, B. acidophilus predominates and B. bifidus decreases. As the individual grows older and the diet becomes much more varied, coincidental with reduction in the quantity of milk in the diet, other bacteria become more numerous as B. acidophilus decreases.

Herter and Kendall,[11] in 1909, were perhaps the first to show clearly the definite relationship that exists between the char-

acter of the food and the intestinal flora. They found that the intestinal flora of both cats and monkeys was rapidly altered when a diet of meat and eggs was followed by one of milk and dextrose, there being a substitution of an aciduric non-proteolizing type for one that was formerly strongly proteolytic.

One can readily appreciate how diet may influence the intestinal flora. The intestinal bacteria to a very considerable extent derive their sustenance from the food in the alimentary canal. The intestinal canal is a veritable culture tube and, by the way, a favorable one in many cases, into which food stuffs are frequently being introduced, as well as a great variety of bacteria. Some bacteria thrive best in culture media containing different kinds of carbohydrates, and others in media containing different kinds of proteins. As the food varies, so will the bacteria also vary.

B. acidophilus grows well in milk and particularly in the presence of milk sugar, or lactose. Hull and Rettger,[12] in 1914, observed the profound effect of lactose in changing the flora of animals from a putrefactive to an aciduric type. They also noted a similar effect of dextrin, but other sugars apparently have no such effect. Torrey,[13] in 1915, found that it took 250 to 300 grams of lactose per day to transform the fecal flora of typhoid patients from the usual mixed type to one dominated by B. acidophilus. In 1921, Cannon[10] confirmed the findings of other workers who had shown that lactose and dextrin when fed to experimental animals in proper proportions led to predominence of aciduric bacteria. He found that the colon-acidophilus ratio in albino rats which he used for experiment could be changed by lactose feeding in some instances from practically 99 per cent colon to 1 per cent acidophilus, to 1 per cent colon to 99 per cent acidophilus.

Rettger and Cheplin[6] have recently published a monograph upon the subject of intestinal flora in which they relate most instructive and significant experiments upon white rats and upon man. They found that when either lactose or dextrin was fed in addition to the usual diet to the amount of 2 grams daily to white rats, a progressive increase in the number of B. acidophilus in the feces could be noted, usually within two days, the maximum being reached in four to eight days, when the feces contained practically nothing but B. acidophilus. As the B. acidophilus increased, the gas forming, putrefactive bacteria decreased and finally disappeared. That this predominance of B. acidophilus existed throughout the intestinal canal was shown by bacteriological examination of the contents of sections of the intestinal canal of some of these rats killed for the purpose. These examinations show that there has been practical elimination of all other types of bacteria. It should be noted, however, that the quantity of these sugars, lactose or dextrin, necessary to produce this effect is comparatively large, one or two grams daily. Much less than this amount failed to have a similar transforming effect.

Rettger and Cheplin also fed these sugars, lactose and dextrin, to men and found that whenever as much as 300 grams per day or more was fed, there occurred rather rapid change in the intestinal flora of the experimental subjects. Within a period of from four to eight days, B. acidophilus constituted most of the viable bacteria present, all other bacteria, including the putrefactive gas formers, having practically or entirely disappeared. If the quantity of these sugars was considerably smaller, say 150 grams or less, although there was considerable increase in B. acidophilus, there was not any noticeable impression made on the number of other bacteria present, especially gas formers.

During the past two years the writer has conducted a number of similar tests with lactose upon human subjects. It will not be necessary to give details here, but the results may be briefly stated. Daily ingestion of sufficiently large amounts of lactose results in rapid increase of B. acidophilus and in due course of time, if the quantity is sufficient, all other bacteria in the intestinal flora are reduced to a negligible quantity. In some instances, however, it required more than 300 grams of lactose per day to establish the B. acidophilus as the predominating organism. In one instance it was only after 450 grams of lactose per day was taken that satisfactory results were obtained. It should be noted that although it has been demonstrated by the work of others and

also by the writer's own experience just referred to that the intestinal flora can be transformed in this way and that these conditions may be brought about and maintained that were the object of Metchnikoff's efforts, unfortunately this quantity of these sugars necessary is too large to be continued over long periods of time. Even if not, the continued ingestion in large quantities of such an uncommon form of food substance would soon become quite monotonous. It would seem, therefore, that regardless of the possibility of transforming the flora by this means, its practical application must be very limited.

Perhaps the first use of cultures of B. acidophilus for therapeutic purposes should be credited to the pioneer work in this direction by Dr. Warren Coleman. As early as 1913 Torrey,[13] at the request of Dr. Coleman, prepared cultures of this organism to be used in the treatment of typhoid fever. The object was to hasten the transformation of the intestinal flora, which was brought about in time by the large amount of lactose in his high calorie diet. Rettger and Cheplin[6] fed cultures of B. acidophilus to white rats in connection with their regular diet and found that when the quantity of culture was sufficient, 1 to 2 cubic centimeters, the fecal flora rapidly changed to one dominated by B. acidophilus. Coincidental with the establishment of B. acidophilus as the predominating organism, other bacteria, including the putrefactive, gas producing types, became less numerous and almost or quite disappeared. They also fed cultures to man and found the same changes, provided the quantity of culture was sufficiently large. They found considerable difference in the behavior of the flora in different individuals. No doubt this was largely due to the fact that they continued their normal diet at the same time which of course would vary with different individuals. Five hundred cubic centimeters of culture frequently produced almost complete transformation. In other instances at least 1000 c. c. daily were required. In the writer's own researches, including a large number of experiments upon twenty-three different human subjects, the results have practically agreed with those of Rettger and Cheplin. When 1000 c. c. of culture or more were taken daily, the flora was changed from the usual mixed type to one consisting almost entirely of B. acidophilus. This change was brought about in a period of from one to two weeks and was maintained as long as the daily ingestion of sufficiently large quantities of culture was continued. However, within a few days from the time the subject stops taking the cultures, the acidophilus population is rapidly reduced and the proteolytic flora returns. In fact, usually within from one to two weeks, the flora is not different from that of other individuals who have not taken any acidophilus culture.

It is of particular interest that relatively large quantities of the B. acidophilus culture are required to bring about radical changes in the flora. As much as 500 c. c. failed in some instances greatly to reduce the proportion of proteolytic bacteria present. In one subject 1500 c. c. daily were required to bring the proportion of B. acidophilus to above 90 per cent of the bacteria present.

The experiments of numerous investigators, which the present writer's experiments confirm, all show that we may transform the intestinal flora from the usual mixed type in which proteolytic bacteria predominate to a simpler one consisting largely of B. acidophilus, either by feeding relatively large amounts of lactose or dextrin or by feeding relatively large amounts of a suitable culture of B. acidophilus. Of course combination of these two measures, in which case the amount of both the sugar and the culture may be reduced somewhat, will lead to the same result. Either of these measures or a combination of both of them may be employed for short periods of time and, therefore, might be taken advantage of in suitable cases. The lactose feeding can be continued for only a few weeks at best. Therefore, its usefulness will necessarily be limited. On the other hand, it is much more practical to continue the culture for a long and, in fact, indefinite period, provided suitable palatable cultures are employed, particularly milk cultures.

B. acidophilus grows well in milk with coagulation and acid production. When properly managed, such a milk culture makes a most delightful food beverage, a glassful of which with every meal is suf-

ficient to maintain the desired intestinal flora. This "acidophilus milk," as Rettger calls it, is a most palatable form of sour milk and is enjoyed by most people who try it.

Bacteriological laboratory facilities are necessary for the production of acidophilus milk and perhaps considerable further experimental work will be necessary before it can become available for general use. However, this will surely come, should further experience show that it actually has any therapeutic value. Whether it has therapeutic value in any of the many diseases and conditions supposed to be due to the action of harmful intestinal bacteria can only be determined by the most careful observations, perhaps extending over a long period of time. It could now be made available for use in hospitals, where there should be ample bacteriological facilities for producing it in sufficient quantities for the patients in the institution in the cases in which it may seem to be indicated.

Whether aging of the tissues, arteriosclerosis of old age or premature senescence can be delayed or prevented by preventing intestinal putrefaction, according to Metchnikoff's idea, will be difficult and will require a long time to determine. We are at least now able to bring about and maintain experimentally and in a somewhat limited way the desired condition with B. acidophilus that was aimed at in the use of B. bulgaricus.

A note of warning should be sounded against our making the same kind of mistake with B. acidophilus that was made with B. bulgaricus. Already enthusiastic workers have reported most striking therapeutic results from the administration of broth cultures of B. acidophilus in teaspoonful doses, only a small fraction of the amount of culture that others have found necessary to change noticeably the intestinal flora. Commercial interests have already placed upon the market B. acidophilus in the form of tablets, capsules and liquids, and physicians are prescribing them. I recently examined some of these preparations on the market to determine the number of viable B. acidophilus contained therein.

In the instance of tablets, none of those examined was found to contain as many as 1000 viable bacteria of any kind per tablet. If it should be granted that all the viable bacteria present were B. acidophilus, it would take more than 1,000,000,000 tablets, or more than 20 tons, to contain as many bacilli as are contained in 1000 c. c., or the usual daily dose, of the acidophilus milk, the quantity found, by most investigators at least, to be necessary to transform the flora. Bacteria were more numerous in the commercial liquid cultures examined. If they were all B. acidophilus, a patient would have to drink only about seven or eight gallons daily to get as many as he would in 1000 c. c. of the acidophilus milk culture.

This is mentioned simply to point out the ridiculousness of attempting to apply acidophilus therapy and accomplish transformation of the intestinal flora by employing these preparations. At the present time we must depend upon fresh cultures produced according to the proper bacteriological methods. Such fresh cultures can be produced and supplied by any competent bacteriologist. Since there are many different strains of B. acidophilus, some of them apparently much better adapted to the present purpose than others, it is desirable that suitable strains should be employed. These must be inoculated into sterilized milk, using relatively large quantities of inoculum, and incubated in the usual way.

The writer will be pleased to send cultures of the strain of B. acidophilus which he has used, to anyone who has the necessary bacteriological laboratory facilities and wishes to undertake researches along this line.

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THE PROBLEM OF THE NEGRO CHILD*

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Opportunities afforded me to observe and to study a large number of negro children will be briefly recited in the hope that you will permit an unusually wide experience to offset in a measure whatever statistical confirmation the conclusions, to be given later, may lack.

Many white children are brought to the Pediatric Clinic of the University Free Dispensary, Birmingham, Ala., but the majority of patients crowding this service are negroes. It is the policy of the clinic to admit to its service only such applicants as fall within the indigent class. This policy is sincerely but not too rigorously adhered to. It happens not infrequently that a white parent is discovered to be in such circumstances that his child is referred from the clinic to private practice. When this is done, in order to prevent misunderstanding on the part of the parent, the latter is given the name of some pediatrician in no way connected with the clinic. On the other hand no negro is recalled who has been refused the free service. Any one familiar with the psychology of the race will understand why it is unnecessary indeed to make close inquiry as to the financial ability of the negro parent. No well-to-do negro will seek free service for his child. Racial pride fills him with desire to pay his way. It is true that he pays with an ostentation lacking good taste, but a similar weakness would be welcome in those whites who apparently labor under the impression that monetary considerations are beneath the dignity of the profession. A negro mail carrier brought his child to my private office. The child had pellagra. The father had to provide for a wife and seven children. His maximum salary was $1800 per annum. Deducting from this the $400 allowed for each child and the $2000 allowed for a wife, one can readily estimate the amount of income tax this negro would have to pay even though he forfeited exemption under his governmental job. Yet it was hard to persuade him that he was entitled to and ought to accept the free service of the clinic.

Among the negroes, with the exception of a very few professional men, a few business men and a few skilled industrial workers, the salary of the mail carrier represents the high water mark of earning capacity for the head of the family. The negro children brought to the clinic are not from the indolent, shiftless class, nor are they the children of the more fortunate mentioned in the class of exceptions above. For the most part they are the children of the ordinary wage earners. Some of the parents may be thrifty, but they find themselves unable to make ends meet when sickness comes. If the doctor is summoned to make house visits, he demands cash. When the cash is exhausted the child is either sent to the charity hospital or is brought to the clinic. Emphasis is laid upon these points because it is felt that while white children seen at the clinic could not be so regarded, negro children seen there are representative of juvenile racial conditions.

Moreover, not all the children brought to the clinic are sick. Through the agency of the nursing staff of the local Health Department encouragement is given negro mothers to bring their newly-born babies as soon as conditions of confinement will permit to the clinic for regular weekly inspections. This feature of the service has developed to such an extent that in order to take proper care of it a separate branch is already necessary.

In this clinic I have been serving as chief for six years. Between the charity hospital and the clinic a close affiliation exists. The chief of the pediatric clinic serves as head of the pediatric department of the hospital. In the hospital there are 19 beds in the negro pediatric ward. Rarely is there a vacant bed. Frequently there is a waiting list. In the obstetric wards of the hospital, there are 10 beds for negro mothers. These beds are always filled, and in addition there is a long waiting list.

The head of the pediatric department is in frequent consultation with the head of

*Chairman's Address, Section on Pediatrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

the obstetric department. Thus through six years of close association with the clinic and the hospital, thousands of negro children have come under my observation.

Based upon these observations certain very definite conclusions have been arrived at which, enumerated, are as follows:

(1) The number of negro mothers unable to nurse their infants is rapidly increasing.

(2) Malnutrition is universal among the artificially fed negro infants.

(3) Of the splendidly nourished nursing negro infants seen in the earlier months, an increasing number begin about the fifth month to cease a lusty gain, and about the sixth month begin to lose weight. By the end of the first year many of these nursing babies are in a condition of grave malnutrition.

(4) Malnutrition is general among negro children between the first and the second year.

(5) Malnutrition is common among older negro children.

If these conclusions are correct, a few more years and the negro race in the South will be so weakened that it will rot because of its low resistance to disease. From an economic standpoint can we afford this? For our own health assurance and for our own protection can we allow this to go on? Were these conditions merely local, attention to them and consideration of them would not be asked for here. I have sought confirmation or contradiction from various sources and from different angles. I have visited the negro districts of the following cities: Louisville, Nashville, New Orleans, Hot Springs, Ark., Jackson, Miss., Mobile and Montgomery, Ala. Nothing was discovered to indicate that the negro in any of these places is any better off than is his black brother in Birmingham. Frankly honest confreres in other communities, both urban and rural, admit to me that for the negro the environs and other conditions of living in their respective districts are conducive to race deterioration.

Last June, under the direction of the City Health Department, a survey of Birmingham's baby population was made.* Four hundred and ninety-nine negro babies were examined at that time. By request I was assigned to a center where only the babies of the negro employees of a large industrial plant were received. This plant is regarded as being unusually fair from the standpoint of wages to its employees. Here I examined 99 babies and saw and interviewed almost as many negro mothers. The housing conditions with this group are decidedly better than for the average, but I found the same condition of ignorance regarding suitable and nourishing food for babies and children. The most impressive feature of any study of the negro race in the South is this fact: the babies are half starved even though their bellies be full.

At this point probably it would be wiser to close this address. There is no desire to inject dangerous discussions on loaded subjects into our Section. I feel, however, that you expect me to present to you without fear or apology any matter which may appear to be vitally affecting and endangering the integrity of our own race.

No matter how fixed may be our conviction that a system of barriers between the white race and the black race is necessary and desirable, we doom ourselves physically and commercially if we fail to realize that some barriers are impossible of construction. No two races can live side by side, the one strong and well, the other weak and diseased; the one clean and moral, the other unclean and unmoral. In connection with the negro I use the word unmoral advisedly. He came from Africa

*Two thousand and twenty-eight babies, 1529 white and 499 negroes, were examined at the time of this survey. A bulletin just issued by the Birmingham Health Department gives a summary of the findings. A higher percentage of white babies than of negro babies showed nutritional defects. This finding was as surprising to the Department as it was astounding to me. I have not had time to analyze all the cards of the babies examined. However, I have carefully studied each one of the 499 cards of the negro babies. Two hundred and forty-four of the negro babies were examined by general practitioners, in fact a great majority of this number were examined by negro physicians. The percentage of normally nourished babies found in this group examined by general practitioners is significantly high when compared with the very large percentage of malnourished found among the remaining 255 negroes examined by pediatricians.

without morals, and he still has what he brought. Has the white man made any sincere effort to inculcate morals in the negro? Is not this still the most favorite subject of the white man's joke? It is a rather nasty kind of a joke, for it has its boomerang. Occasionally there is a black body burned at the stake or riddled with bullets. Remember, too, it is not the pure strain negro who is found coveting social equality—it is always the mulatto!

Can the white race prove its wisdom and superiority merely by compelling the black man, when weighing his economic, social, religious, political and moral problems, to accept low standards? The standards for the two races may and probably ought to be different, but there can be false standards for neither without hurting the other. With disease rampant among the negroes, with abundant evidence of their general race deterioration, it is time for the white race of the South to lay aside its perverse obstinacy and foolish sensitiveness. It is time for us to look matters in the face without scare from that old bugaboo, social equality.

Not in the name of philanthropy or of humanitarianism, not for the sake of the negro, but in the name of our own common sense and of our own race decency and for the sake of our own industrial, moral and health assurance, I ask you, who with me are devoted to the welfare of our beloved Southland, to contemplate with me, with concern, the conditions which make disease so prolific in the black race as to render our own race unsafe.

Surely there can come no danger, there can be no remote possibility of instilling a desire for social equality, should you see fit to join me in advocating for the amelioration of the negro race in the South the following measures:

(1) There should be laws preventing the building of grouped houses which, though unfit for habitation by beasts, are used for negro tenants. There are thousands of negro cabins in the towns and cities and the rural districts which force their occupants to live a life which breaks every law of health and of morals known to man. They are money-makers, but they make, too, for sin and crime and disease. They are literally the hot beds of gonorrhea and syphilis. "Welcome" to tuberculosis is written upon every doorstep. They are the white man's greatest sin, more fiendish than the fury of the mob. And they are the white man's most foolish sin, for by them he endangers himself. Hundreds of such houses are at the present moment under course of legal construction.

(2) There should be laws preventing extortionate rates of interest on borrowed money. Some of the states which have already passed excellent laws along this line still leave unregulated health insurance companies and furniture dealers selling on the installment plan. Laws protecting the white man from his own gullibility are numerous. Why should not the black man be protected against evil agencies which play upon his ignorance and credulity?

(3) There should be laws stringently regulating the practice of midwifery. The negro midwife's gross ignorance regarding the laws and the principles of asepsis and antisepsis combined with her superstitions make her a very potent force looking toward the extermination of the race.

(4) There should be formed among the white men of the South an organization for the purpose of helping the negro by instructing him how to spend his earnings without being cheated. So long as there exist so many members of the white race who seek affluence and riches by the method of preying upon the negro's credulity and child-like trust, there is nothing impractical or utopian in this suggestion. Money-making houses which are nothing more than fire and disease traps; useless furniture, the shoddiness of which is concealed by its gaudiness; and money easy to borrow but with hard rates of interest, are not the only methods of imposing upon the negro. The white man is wily and his methods of separating the negro from his money are multiple. By playing upon the imagination he creates symptoms in the negro where previously none may have existed. Then he sells him patent medicines by the barrel. Pandering to his foolish vanity, the white man sells him "anti-kink" and other abominable and stinking hair lotions, vile perfumes, startlingly effective face powders, and dress which is only a fantastic and flimsy imi-

tation of the white folk's. By the attraction of its abundance, unwholesome and even tainted foods are worked off on him. Cajoled by peddlers he buys gewgaws. If not utterly useless the articles purchased are inferior and sold at an enormous profit. Pistols and other firearms, dice, Bowie knives, etc., are temptingly exhibited before him. A considerable part of the merchandise displayed in every city of size is calculated to catch the negro's money even though he be encouraged in unlawful weaknesses.

It is folly for the white men of the South to continue to organize for the purpose of keeping the negro in his place. "Keeping the negro in his place" always means keeping him down. It is time for us to recognize the wisdom and the patriotism of organizing to help the negro, to help him without the promptings of gushing sentimentalists of the East and the North, but to help him sanely and safely to a position of contentment and of better citizenship. Help him to buy his money's worth in good, suitable food, good raiment and good homes and much toward these ends will have been accomplished. That impecuniosity, so common with the negro, is due not so much to poor earnings as it is due to unwise spending at the counter of a cunning white man.

Migration or indolence, open insolence or secret acts of defiance too often result when it is attempted to terrorize the negro by punishment meted out by agencies other than lawfully constituted authorities. When the white man becomes more willing to contemplate his own sins of omission and of commission against the negro, then will he become less ready to countenance and encourage organizations which foment race hatreds and race prejudices. You can not teach the negro self-respect, self-restraint, self-help and self-health by the dark and extra-legal methods adopted by spook organizations. You can not inculcate morals in the negro by joking him about immorality. You can not give the negro religion by making fun of his religion. Moreover, you can not raise a stalwart negro upon condensed milk, poor food, poor housing, poor opportunities for betterment, etc.

Some of us have made a lot of money out of him. Some of us have had a lot of fun out of him. Some of us have even made monkeys and clowns of ourselves in order to prove our superiority over him. Are we yet ready to consider the negro seriously as he affects our own race from our economic, moral and health standpoint?

THE RELATION OF RADIOLOGY TO CANCER CONTROL*

By Thomas A. Groover, M.D.,
Washington, D. C.

Dogmatism on the part of the medical profession is as great a deterrent to medical progress as is an unbridled credulity.

Generally speaking, we are traditionalists. We are prone to look askance at new procedures and new methods, and may be blind to the fact that much that has been handed down to us from the fathers is ripe for the discard. We set great store by the teachings of those whom we choose to call "authorities" on this subject or that, and lose sight of the fact writ in large letters across the pages of medical history, that in the science of medicine there is no "authority." This applies with peculiar force to the cancer problem, and should serve to temper all pronouncements having reference to the control of cancer as a public health measure.

If we examine the literature intended both for lay and professional distribution relating to this phase of the subject, we shall find that in much of it radiology is referred to mainly for the purpose of warning against it, and by a broad implication at least, the motives, good faith and professional competency of the radiologist are impugned. Under the guise of a public health crusade, leaders in medical thought have also given expression to similar sentiments on the public platform and through the columns of the daily press. It is doubtful that the exigencies of the situation, or the facts in the case, justify such dogmatic pronouncements, which do not

*Chairman's Address, Section on Radiology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

foster that helpful cooperation essential to the success of such movements.

Whatever may be the future of radiology in the treatment of malignant disease, it is doubtless a fact that the radiologist is seeing more cancer at the present time than any one else, and his is an unparalleled opportunity for gaining a comprehensive knowledge of the disease in its various aspects. With this opportunity there has come the added responsibility of relating himself to the cancer problem as a whole in such a manner as will, so far as possible, eliminate all questions of prejudice or self interest.

If the treatment of cancer, regardless of the method employed, becomes a habit rather than a subject of intensive study, the results of the attempt at its control will be meager. If we, as radiologists, are content merely to bathe a mysterious growth with a more mysterious ray without attempting to analyze the reasons for success in one instance, and failure in another, we are not living up to our opportunity or fulfilling our duty as public servants.

If we carefully analyze the histories of our cancer patients we can in a surprisingly large percentage of them definitely fix the responsibilitiy for our failure to prevent or cure the disease. It is, of course, a well known fact that in many instances the cause of failure is incident to delay on the part of the patient in seeking medical advice, and much of the propaganda for the control of cancer has been directed along this line. But we, as a profession, have been inclined too frequently to shift the burden of responsibility to the patient, without giving due consideration to our own deficiencies.

It is obviously futile to advise the layman to seek medical advice early unless there is some reasonable assurance that the advice he receives will be sound. That this is frequently not the case will be attested by all who come in contact with many cancer cases and who have given serious consideration to the subject.

In analyzing the histories of many advanced cancer cases referred to our laboratory we have been impressed by the fact that most of them sought medical advice fairly early. This fact has in many instances been their undoing, because the difficulty of early diagnosis has led to improper or inadequate treatment. The cancer that can be easily and unmistakably diagnosed has often already reached an incurable stage.

We are no doubt all familiar with the stock advice and treatment given many of these patients, such as "Forget it"; "We'll watch it for a while"; "A little salve"; "Paint it with iodine"; "Touch it with caustic"; "Snip it off"; "A little x-ray or radium," etc. Such advice is pernicious in any case that even remotely resembles cancer. If we are to teach the public that the control of cancer depends largely upon its prevention and early recognition, we must be prepared to back up our pronouncement with much more radical advice than is commonly given. "Watch it grow" may be a fine slogan for many enterprises, but it is a pernicious one to apply to any lesion that resembles cancer.

I, of course, do not advocate going to the extreme of the cancer quack in calling everything from alopecia to bunions cancer. Our aim should be to cure the patient even though it may at times involve a sacrifice of scientific accuracy in diagnosis.

The prophylaxis and early diagnosis of cancer is a subject that requires special study, and often times taxes the resources of the most experienced. The establishment of cancer clinics, manned by men of recognized experience, which would function in an advisory capacity, may form a very important link in the problem of cancer control. The success of such institutions would depend upon the indorsement and cooperation of the profession as a whole. If this could be secured they could be made of practical benefit in a direct way, and also as educational centers for both the medical profession and the public in the fundamentals of cancer control.

We must school ourselves to be more radical in our diagnoses, and we must also raise our standards of efficiency in treatment. A distinguished cancer expert, Dr. Jos. C. Bloodgood, stated recently, in discussing cancer of the breast, that local recurrences following surgical excision of breast cancer, were evidence of bad surgery. If that be true, most radiologists are prepared to testify that there is a

tremendous amount of bad surgery. However, an indictment no less severe could with equal propriety be brought against the radiologist. Proof of this can be found in the extremely wide variations in dosage given by different men, even after allowance is made for differences in the technic employed. Those employing essentially the same technic in other respects will show variations in the time factor of over 100 per cent. In general it will be found with radiology as with surgery that those employing the more thorough and radical methods will show the higher percentage of favorable results.

In mapping out a plan of attack upon cancer, or a potential cancer, we have not always a clear conception of the issue involved, namely, that in most instances it is a question of life or death, and that if we fail to destroy the cancer utterly and completely, the cancer will inevitably destroy the patient. We do not always properly balance our treatment of the patient and our treatment of the disease. The radiologist has been unduly handicapped by the prevailing idea that under no circumstances must he do anything that would jeopardize the vitality of a healthy cell. Until he is allowed some of the latitude in this regard that has been by common consent conferred upon the surgeon, his efforts in combating cancer will fall short of the goal. Is it not possible that some of the success of the German in the radiotherapy of cancer can be explained by his proverbial "ruthlessness" rather than by his greater wisdom or technical superiority? I should be glad to see the term "erythema dose" discarded in so far as it relates to the treatment of cancer. We should learn to think instead in terms of a cancer dose. This may eventuate in establishing a mortality rate chargeable to the treatment, but I can see no reason why the radiologist should not be entitled to the same privileges and immunities in this regard that have always been enjoyed by his surgical confreres.

The role generally accorded the radiologist in the treatment of malignant disease has in the main been one of compromise, and is to say the least somewhat anomalous. Radiology has quite generally come to be looked upon as the adjunct of some other entirely unrelated method of treatment. There may, of course, be some theoretical or even practical justification for such a relationship, but fundamentally it is believed to be unsound, and it is quite conceivable that such hybridization of methods may in the last analysis react to the detriment of all. If we assume, for instance, that a patient has a radical operation for cancer of the breast and is then referred to the radiologist for treatment, what is it that the radiologist is supposed to treat? It would seem that he is called upon to treat a patient who is either cured and does not need his services, or one who has a cancer that has been more or less traumatized. If he is expected to cure the latter, it is reasonable to assume that his chances of success would have been equally good, or perhaps better, had no operation been performed.

It is quite certain that a combination of entirely unrelated methods in the treatment of a disease do not as a rule stand the test of experience, and it is more than probable that the combination of radiotherapy and surgery in the treatment of cancer will, in the fullness of time, prove no exception to this rule. It is of paramount importance for the radiologist and the surgeon to have each a clear conception of his limitations in order that the treatment of a given case may be either elective or selective as the circumstances may indicate.

The foregoing is not intended to apply to such surgical manipulations as may at times be necessary to get an adequate amount of radiation into the tissues, but only to a combination of wholly unrelated procedures having the same therapeutic objective.

In conclusion, I should like to point out certain fallacies that are likely to creep into statistics, particularly as they relate to a comparison of results of different methods of treatment. We are coming more and more to realize that it is extremely hazardous to speak of curing cancer, and it may be that an evaluation of a method of treatment could be better expressed in terms of average longevity and well being instead of percentages of so-called cures. We should apply the methods of the insurance actuary in formulating

the value of our therapeutic measures in cancer, for without wishing to sound a note of pessimism, we must frankly admit that while we have many "cures," we have not as yet in a true sense a cure for this dread disease.

DISCUSSION

Dr. A. L. Gray, Richmond, Va.—I was somewhat surprised at Dr. Groover's reference to the cancer propaganda reflecting upon roentgenologists and radiotherapists. In the lectures that were sent out for local delivery last year there was nothing of that nature. I have seen slighting references made by radical operators to radium and x-ray, reported in the secular press as well as in the medical journals.

I venture to say that there are not three men in this audience this afternoon who give the same dosage to malignant conditions or even approximate the same dose. We must try in some way to standardize our treatment of conditions.

I very much like his reference to the fact that the surgeon is allowed liberties in the way of mutilation which would be criminal if taken by us, according to the views of the medical profession and the laity. Everybody is so afraid of an x-ray burn that the roentgenologists have a hysteria upon the subject. If we are permitted to ray something that we know means certain death if it is not destroyed, and we get a pronounced x-ray burn, if we have destroyed that growth and kept the patient from dying we are justified.

Dr. E. C. Thrash, Atlanta, Ga.—People have been killed by surgery for the past five thousand years and they are accustomed to it. Surgery must be carried on regardless of the fact that many die, and the medical profession ought not to throw up its hands and say, "I know nothing about x-ray," when some one gets a little erythema or a falling of the hair. They will look at this as though the operator should be sued for damages. We ought to go before the profession and the different associations and impress upon the members the importance of x-ray therapy. We should tell them that often when the x-ray has apparently done harm it has really done good because it has destroyed the lesion, and that is the most important thing. It occurs very frequently in Atlanta that the x-ray men are sued for damages caused by treatment. There are more lawsuits brought against radiologists in proportion to the work they do than against men in any other field of endeavor.

Radiology is the greatest single therapeutic and diagnostic agent that we have today, and its value is greater in therapy than in diagnosis. The public needs educating upon this subject and we need to educate it by educating the medical profession. We need the doctors to stand by us. I do x-ray work only in connection with my practice as an internist, but I do more for my patients as a whole with roentgenology than with other agents.

The essayist states that the patient is either cured by operation or is left in a cancerous state, and implies that the roentgenologist could have done more good if he had taken hold of this case primarily. I should like to ask if he does not consider primary surgery of great aid in x-ray work? Would he deem it wiser to remove a breast and later follow with x-ray treatment of the glands, or to remove a uterus and later follow it with rays than to treat it with x-ray from the beginning? He has left the audience in doubt and with the feeling that any case may be handled better with x-ray than with surgery.

Dr. W. P. Whittington, Asheville, N. C.—Those of us who have studied cancer know that we cannot tell whether an apparently benign tumor will become malignant or not. The prime object in all malignant diseases is to make an early diagnosis. The next thing is to treat them accurately and energetically with the means at our command. X-ray properly administered is excellent treatment. There is no use in burning the patient with a malignant disease, if we give the proper dose. You can give an effectual dose which will cure the patient without producing an injury even to the skin.

Dr. L. B. McBrayer, Sanatorium, N. C.—I, too, would like to hear how the essayist explains the apparent slight he places upon the cancer propaganda. It is a disgrace to the medical profession of the South and of the United States that the people do not know when they have cancer or how to have it treated. They are going to old women, black and white, to ignorant men in every section of the country and perhaps occasionally to quack organizations with plenty of advertising to have their cancers treated by pastes and what not. Since we have found how to treat these cases with the x-ray and radium the profession should carry the message to Garcia, that the people should find out too. The cancer clinic appeals to me as an extraordinary good method for bringing it to the attention of the people. It might be connected with the groups that are being formed.

Dr. Groover (closing).—When we go before the public to instruct it regarding the dangers of cancer we should tell not only how to treat cancer, but that early cancer or early potential cancer is difficult to recognize, and that unless we change our attitude regarding these suspicious lesions we shall not accomplish anything in the control of the cancer situation.

I have no particular criticism to make of the combined use of the two agents, surgery and x-ray, in the treatment of cancer, but I believe that the time will come when we shall say that this particular case is a case for x-ray and that particular case is a case for surgery. It is not logical to use two entirely unrelated methods having the same therapeutic object. The establishment of cancer clinics I believe will be the outcome of the propaganda for cancer control. Just how the details of administration of these clinics will be worked out I am not prepared to say, but we have not done our duty to the public by scaring the people and not offering anything to overcome the difficulty.

A CASE OF EPILEPSY WITH MEGACOLON (HIRSCHSPRUNG'S DISEASE) AND POLYMASTIA*

By E. Bates Block, M.D.,
Atlanta, Ga.

The extra-cranial causes of epilepsy are not proven and are looked upon with considerable skepticism by the medical profession. Occasionally cases are reported which seem to prove a relationship, but there have been no critical studies of a sufficient number of cases to place the subject upon an indisputable basis. It seems desirable to record as many cases in the literature as possible in order to furnish material upon which to base future judgment of this important question in epilepsy.

The abdominal cavity furnishes two important possibilities of a profound influence upon the brain, in that the control of the cerebral circulation lies in the splanchnic area, and that intestinal intoxication, while not in itself sufficient to produce epilepsy in an otherwise healthy person, plays a part in the production of convulsions in those who are predisposed to them. No enlightened neurologist ever fails to pay marked attention to the daily evacuation of the bowels in any case of epilepsy, no matter what the cause may be. It is well known that constipation provokes convulsions in epileptics though it cannot be demonstrated to be a cause of epilepsy. On account of this fact it seemed interesting to review as much of the literature as was available to find out if megacolon (Hirschsprung's disease) showed any considerable coincidence in epilepsy.

Unfortunately the histories of practically all of the cases were meager and had to do only with the abdominal symptoms and signs, while occasionally a brief mention was made of imbecility, insanity, etc. Finney says:

"The nervous system does not seem to be directly affected by the disease. Children in the later stages often become apathetic and somnolent. Convulsions have been observed in a few instances."

The case reported by Lewis was considered to have symptoms of epilepsy. In Popper's case there were three severe convulsions which he attributed to toxemia. It is thus seen that the references to convulsions and epilepsy are rather rare. The present case is reported in the hope that it will stimulate a more systematic search for the same anomaly in other epileptics.

CASE REPORT

A boy 11 years old, of semitic parentage, was seen first on July 22, 1922. His chief complaint was convulsions.

Family History.—His father, mother and one brother were living and well. One brother died at 12 weeks of bowel trouble. The mother had had no miscarriages. There was no history of nervous or mental diseases in the family.

Past History.—He was born at full term. The labor was normal, lasting about three hours. No instruments were used. He had had no accidents or injuries. He was circumcized at the age of one week. His tonsils were removed at three years, adenoids two years previously and also roots of tonsils which had been left from the former operation. He had measles at three years, whooping cough at eight months, and chicken pox four months previously. He had nose bleed often since the age of three years, always due to a blow or picking the nose. No worms were ever seen in the stools and on examination the stool was negative. There were no scars on the body except a one-inch linear scar on the back of the left calf from a cut six years before. There was a history of constipation from birth which had required constant watching and care from his parents.

Present Illness.—His attacks occurred in 1920 on June 20 and November 19; in 1921, on March 23 (2), on June 30 (2), on July 12, October 25 (2), December 7, and December 23; and in 1922, on February 27, May 18, June 30, July 7, and July 11, making 16 attacks altogether.

All attacks came on either about one and one-half hours after going to bed or in the early morning before getting up. They started with a gurgling noise in the throat and the muscles of the whole body twitched. At other times the movements were on one side or the other, the face was livid, there was much flow of saliva and foaming at the mouth, the jaws set, and the eyes were half open and drawn upward. He never bit the tongue. He passed urine in two or three attacks. He slept after the attacks and on waking had a headache in the occiput, and sometimes vomited. There was always a complete loss of consciousness, and coma after the attack might last from one to three hours. All attacks were while asleep, and there was no aura. Two attacks were preceded by abdominal pain. The clonic spasm was usually all over, and was accompanied by sweating. The attacks lasted two to five minutes. There had been no minor spells, such as vertigo, dizziness or noises in the ear, and no auditory, visual, taste, smell or cutaneous sensations were complained of.

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*Chairman's Address, Section on Neurology and Psychiatry, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

The attack on June 30, 1921, was preceded by intense abdominal pain lasting one hour, which was finally relieved by ice bags. Soon after dropping off to sleep he had a convulsion. One other attack was preceded by abdominal pain.

Neurological Examination.—The Binet-Simon test showed ten-year intelligence age.

Emotional State.—He was irritable and hard to manage at times, and was controlled better by kindness than by harshness. He had more egotism than the average boy, the father thought. He was impulsive and insisted upon having what he wanted immediately. He was somewhat selfish, restless, wanted to be doing something all the time, and changed what he did constantly. He quarreled and often fought with boys, and was fearless, stubborn, and self-willed.

His judgment was good, as were his attention, apprehension, apperception and orientation. There had been no hallucinations, illusions or delusions, and no imperative ideas. His memory was good, and his general knowledge was good for his age. Comprehension and association of ideas were good.

Cranial Nerves.—(1) Smell was normal and equal on the two sides.

(2) Vision was good, 20/20. Fields of vision were normal. Color vision was normal. There was no edema of the discs, but the veins in the right eye were distinctly full and tortuous, which might be interpreted as an early passive congestion, or a normal but individual peculiarity.

(3), (4) and (6) The pupils were equal, reacted to light, and during convergence, the eye movements were good. There was slight nystagmus to the right.

(5) The trigeminal nerve, motor and sensory portions were normal.

(7) The facial nerve was normal, and taste was normal.

(8) Hearing 12 inches both ears. A. C. better than B. C. No paresthesia. No positive Romberg.

(9) No nausea. No difficulty in swallowing. Taste normal. Gag reflex present.

(10) No vomiting except from headaches after some of his attacks. No dysarthria. Pulse 20 to the quarter minute. Respiration 20 per minute. Blood pressure: systolic, 102; diastolic, 70.

(11) Movements normal.

(12) Tongue movements normal. Tongue was slightly coated.

Motor System.—He was right-handed. The muscle strength seemed equal and good on both sides. The right grip was 45, the left 40, and diadochokinesia was normal. Motor tests showed good speed, steadiness and accuracy.

Reflexes.—The biceps, triceps, ulnar, radial and Achilles reflexes were all somewhat exaggerated, but equal on both sides. The abdominal, cremasteric and sole reflexes were normal.

Sensation was normal everywhere. There was no muscular atrophy and no secretory disturbance. The control of the sphincters was perfect. Stereognosis was good. His baric sense was good. There had been no headaches except after his convulsions.

General Physical Examination.—The teeth were good. The palate was high arched, and the throat and nose were normal. The eyes were good. He had never had trouble with the ears. The post-cervical lymph glands were palpable. The patient was well nourished. His height was 57½ inches and weight 99½ pounds. His age was 11 years. The normal weight for that age is 78 pounds. The lungs and heart were negative. The abdomen was distinctly full, prominent and tympanitic. The liver, kidneys and spleen were not palpable. He had never been jaundiced. On the left side there were two extra nipples 10.5 and 15.5 cm. below the left nipple.

Laboratory Reports.—Blood: hemaglobin, 70 per cent; red blood corpuscles, 4,000,000; leukocytes, 8,600.

Wassermann was negative.

The urine was amber, slightly cloudy, with a specific gravity 1.017, and an acidity of 12.5 to 25 c. c. (In another test 31 to 25 c. c.) It was negative for albumin and sugar. Phosphates were precipitated on boiling. There was a marked indican reaction. There were many amorphous phosphates, and a few mucous strings.

The stool examination showed no worms or eggs. X-rays of all the upper and lower teeth were negative.

The skull showed considerable convolutional atrophy of the cranial bones. The sella was normal in outline and the clinoidal processes were distinct. The lungs and heart were negative. The esophagus was normal. The stomach was enlarged and showed slight ptosis. The colon and sigmoid were extremely large and the latter extended high into the abdomen. The increase in capacity commenced just above the rectal pouch, involved the sigmoid and extended up into the descending colon. The diameter of the colon was twice that of normal for the patient's age.

Granting for the sake of argument that a relation exists between megacolon and epilepsy, we are still in great doubt as to what this relation may be. According to Finney, great increase in the amount of indican has been observed, and the relation may be a toxic one. There is also a great increase in intra-abdominal pressure as shown by the distension and pressure upon the thoracic viscera.

The theories as to the cause of megacolon are very varied and quite as uncertain as the causes of epilepsy.

Bing sums them up as follows:

(1) Congenital dilatation and hypertrophy of the colon (Hirschsprung).

(2) Abnormal length and looping of the sigmoid flexure (Marfan).

(3) Congenital ecstasia of the lower section of the colon with aplasia of the musculature according to Concetti, who regarded the dilatation and hypertrophy above it as secondary.

(4) Idiopathic dilatation of the colon (Griffith).

(5) Spasm of the sphincter ani (Fenwick).

Finney calls attention to numerous other theories advanced, chief among which, and related to Concetti's theory, is the neuropathic dilatation and hypertrophy advocated by Hawkins, Formad and others. Bing also concludes that the disease is caused by a defective innervation of the colon. It is probable that each of the theories advanced accounts for some cases, but that none of them account for all. While some believe the dilatation and hypertrophy is the cause of the constipation others believe it the result. Finney found remarkably enlarged lymph glands and dilated lymph and blood vessels in the thickened mesocolon and lymphangiectasis and vascular dilatation in the intestinal walls. Finney found no pathological anomaly of the intrinsic ganglia in the colon in his case. He believes that there is an overnutrition of the sigmoid and colon.

Little if any doubt can exist that the disease in children is usually congenital or at least prenatal, as its symptoms are manifested often from the day of birth. In the case of Hobbs and deRichmond the abdominal distension interfered with birth. It tends to become worse with intervals of comparative comfort as the patient grows older. If we accept the neuropathic origin of the dilatation and hypertrophy of the sigmoid and colon we are still undecided as to whether some anomaly in the brain is responsible for the interference with the sympathetic nerve supply to the intestine or whether the peripheral part of the nervous system is at fault. We, therefore, have three possibilities to consider:

(1) The epilepsy and megacolon may represent (equally) evidence of defective development of the nervous system.

(2) The megacolon by pressure may produce an alteration in the cerebral circulation.

(3) The resulting constipation from megacolon may furnish a toxic cause for convulsions in those predisposed to them. In the case here reported no other physical defect could be found except polymastia, a convolutional atrophy of the skull, from apparent pressure, but without the usual symptoms of pressure being present, full tortuous veins in the right fundus, and the megacolon. While the last was not of the extreme degree found in many of the published reports and fatal cases, it is still sufficient to produce abdominal distension, tympany, and constipation, and must be regarded as pathological. The occurrence of polymastia must be regarded as a stigma of degeneration, but whether such atavistic phenomena should be regarded as evidence of physical strength or weakness is undecided.

The two attacks of severe abdominal pain preceding the convulsions probably meant an increase in abdominal pressure from an increased distension of the colon with consequent increased intra-cranial pressure.

The conclusion in regards to this case is that the increased intra-abdominal pressure has caused a gradual increase in intracranial pressure, which in turn has caused a convolutional atrophy of the skull, and tortuous veins of the right retina, and that the absence of headache, vomiting and slow pulse are due to the gradual process.

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TROPICAL DISEASES AND PUBLIC HEALTH

CIENCE VS. MAGIC IN THE EVOLUTION OF PREVENTIVE MEDICINE*

By S. W. Welch, M.D.,
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Civilization has been defined as "the flow the human species, a recent and a fra-le thing." Since its twilight dawn, the rces of ignorance and superstition, twin sters of crime, have been opposing the rces which make for the development of ience and of art. It is an interesting udy to mark the part which the ex-nents of medical science have had in lling the world out of the darkness of rbarism and placing it in the light of a ientific day.

The human species has been fond of the ack art and has been pleased in every neration to be deceived. It is a fascinat-g story which relates the several phases the evolution of medical science and its posure of the several isms and cults nich have fallen by the wayside as the arch of events has left them isolated and rgotten.

The heel of Achilles was the glory of race. Saul doffed his crown to the itch of Endor. The leach and the bleeder d his day, to be supplanted by the super-tion of the cure of King's evil, the ab-rdity of the weapon ointment, the craze the tar water mania, the enthusiasm of rkinism or the metallic tractors, the eam of homeopathy, and, in later times, e eruption of the drugless healer, the opath, Lydia Pinkham, Sister Mary ker Eddy, Peruna and the chiropractor. Peruna in its old formula were obtain-le in these days of cults and isms, no ers would need apply.)

History tells us that in the short period twelve years Charles the Second cured the touch of the royal hand more than 100,000 people affected with scrofula. There are records of marvelous cures by the use of the weapon ointment which consisted of anointing the weapon which inflicted the wound and seeing the wound heal as a result of this treatment within the course of a week or ten days. When a man failed to be cured by the anointing of the weapon that had dealt him a wound the character of the individual was assigned as the cause because the devil required of those to be benefited that they believe in the device. A refinement of this idea found expression in the sympathetic powder, which, if applied to the blood-stained garment of the person injured, would relieve the trouble even though the individual were a long way off. On analysis, this powder proved to be nothing more than blue vitriol (common blue stone).

Bishop Berkeley, one of the most learned and accomplished gentlemen of his age, was the great exponent of tar water. One of his aphorisms was that "Tar water, temperance and early hours would cure any disease."

The metallic tractors invented by Dr. Perkins, of Massachusetts, had their day in song and story and many a person said to be ill of serious maladies felt himself healed instantaneously by the placing of the two poles of the instrument upon the head or upon the soles of the two feet. Any and every disease was extracted from the body by this simple device.

The following paragraph, which was penned more than a hundred years ago, reminds one of a hearing before a criminal court or a legislative committee of the present day:

"Will the medical man who has spent much money and labor in the pursuit of the arcana of physic, and on the exercise of which depends his support in life, proclaim the inefficiency of his art, and recommend a remedy to his patient which the most unlettered in society can employ as advantageously as himself, and a remedy, too, which, unlike the drops, the pills, the powders, etc., of the Materia Medica, is inconsumable, and ever in readiness to be employed in successive diseases?"

"The motives," says the disinterested Mr. Perkins, "which must have impelled to this at-

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*Oration on Public Health, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

tempt at classing the metallic practice with the most paltry of empyrical projects, are but too thinly veiled to escape detection."

In 1796, Samuel Hahnemann published his first paper containing his peculiar views, which laid the foundation of the school of homeopathy. The doctrine spread rapidly on the Continent and in England and found its way to America in the first half of the Nineteenth Century. In 1907, there were 1039 graduates of homeopathic schools in the United States, and in 1922, 517. The schools teaching homeopathy have been gradually eliminated or have adopted the necessary equipment, methods and subjects taught to meet the demand for scientific training.

This cult was in a large measure eclipsed by Sister Mary Baker Eddy, Lydia Pinkham, Peruna, the drugless healer and the osteopath. These have in recent years been eclipsed by the more aggressive chiropractor. This latter cult is very indignant that the medical profession should decline to recognize its claims to proficiency in the healing art. One is reminded of a man who presented a method of squaring the circle to the French Institute of Science and another who brought proof positive that the moon and planets were at a distance of little more than one hundred miles from the earth. Each was indignant that the French Institute of Science did not investigate his claim to a new discovery.

While each of these cults and isms has appeared upon the scene of action, scientific investigation by the medical profession has gone steadily forward in the discovery of new methods and new means of prolonging h u m a n life. Vaccination against smallpox, opposed by all of these cults, the discoveries of Pasteur, Koch and their co-workers, ridiculed by them, the discoveries of Manson, Ross, Carter, Gorgas and Le Prince, denied by them, have brought the world face to face with a life-saving knowledge which can be accepted and defended by all scientific minds.

These discoveries have taught us that death is not the accidental and haphazard thing we once thought it to be, but on the other hand, the most orderly process in Nature. The bony framework upon which the human body is built may be likened to a room in which an artistic housekeeper has arranged attractive furniture. The brain or nervous system, for instance, is enclosed in the bony cavity of the skull and finds its prolongation down the spinal column. It finds itself in delicate adjustment to the respiratory system, enclosed within the bony cavity of the chest, which communicates with outside environment through openings in the face. Each finds itself in delicate relation to the digestive and to the circulatory system, and to the excretory system and to the endocrine system, etc. A disturbance of the relations of any one of these systems to the other is the beginning of age and the end. A disturbance of the function of the kidneys will prevent the elimination from the blood current of waste products, which, in turn, throws out of equilibrium the nervous system or digestive system and reacts again upon the circulatory system so that we frequently see a man of thirty as old in appearance as a man of fifty should be, a man of forty as old as a man of sixty should be, and a man of sixty in the decrepitude of age.

Medical science brings us the knowledge of the relations of these finely adjusted systems to each other and the methods necessary to be used to keep these fine adjustments undisturbed. Conscience and public sentiment crystallized into law require that men master this science before they shall presume to correct any disturbed relations of this delicately coordinated machine.

We should not think of sending a plumber to examine a bank any more than we would send a bank examiner to mend a boiler, or a boiler-maker to prepare a field for the planting of cotton. If these things of commercial or mechanical art require special training to keep the several branches of industry and enterprise in proper relation and in running order, how much more should those of us who deal with the delicate organism known as the human body be equipped for superior workmanship?

But, says a dispirited brother, "The chiropractor makes barrels and barrels of money without any scientific equipment at

all." So does the three-card monte player and the bootlegger. Natural and statute law demands that we pay for whatever we get. The man who starts out in life with the sole purpose of making money can always do it if he is willing to pay the price. But there are richer things than silver. There are purer things than gold. A man is especially blessed not when he is prosperous and rich, but when his environment is such as to bring out the best there is in him; when he is provoked to goodness, stirred to strength, tempted to nobleness. These conditions are met in the doctor's life when those among whom he lives and labors respect him for his attainments, honor him for his achievements and love him for the good he tries to do. So when we have these higher and better things, why should we envy or care for the ephemeral success of the chiropractor?

One of the most striking pen pictures of ancient literature, sacred or profane, is that magnificent apostrophe of Charles Dickens over the death of Little Joe, when he said:

"Dead your Majesties, dead my lords and gentlemen, dead my right reverends and wrong reverends of every order, dead men and women born with heavenly compassion in your hearts, and dying thus around you every day."

This mercenary brood all the way through the generations of men from the Witch of Endor to the chiropractor has never brought forward one suggestion for the prevention of the ills of men on whose pain-racked bodies they fatten. In the meantime, medical science has developed a prevention of smallpox, a prevention of rabies, a prevention of diphtheria, a cure and prevention of hookworm, a prevention of typhoid fever, a prevention of yellow fever, a cure and prevention of malaria, and other scientific measures too numerous to mention, while surgery has gone forward by leaps and bounds, finding cures for specific ailments which if left to be fingered by the chiropractor and his tribe result in the death of the individual. These discoveries of medical science have increased the average span of human life one hundred and forty-four months in the last half century. All of these things medical science has brought to a suffering world and with them the sharp cry, "Dead, men and women born with heavenly compassion in your hearts, and dying thus around you every day."

How long shall we labor and the cultist reap the reward?

OUR SOUTHERN PROBLEM*

By Ennion G. Williams, M.D.,
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The South has had more sickness and a higher death rate than other sections owing to the long warm season, causing more and greater varieties of plant and animal parasitic life which prey upon the human. The results have been malaria, the dysenteries, infectious diarrheas, typhoid, intestinal worms and the periodic invasion of yellow fever. The wonder is not that the death rate of the South has been larger than the North, but that the disproportion has not been greater.

Now the situation has changed. The discoveries of recent years have shown how all the diseases characteristic of the South are caused and how they can be eradicated and, furthermore, we know now that the diseases common to both North and South can be more easily prevented in the South than in the North. We then have but to use the knowledge in our possession to make the South the healthiest section of our country, with the lowest rate of sickness and death.

Our problems are not those of the North. Men of the races that preponderantly form the population of this country have not been inured through ancestral generations to the rigors of severe winters with their inevitable wide variations of temperature. It is not believable that any heritage of habitation can grant complete immunity to violent climatic extremes. Our problems are those of a land where the sun

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shines comfortably even in the coldest months, where cold is truly a relative term. Even our winters are balmy. We are so accustomed to the luxury of warmth that we conjure up shivers in a temperature that elsewhere would be considered a gift from heaven.

Let us briefly consider three diseases which have principally affected our section: yellow fever, malaria, and hookworm.

We all remember how yellow fever periodically invaded the South, leaving in its wake death, sickness and financial and industrial panic. In no disease was the economic loss so distinctly and immediately felt. As soon as the cause of yellow fever was discovered, the state and Federal governments promptly used this information to free the country of the menace and with the assistance of the International Health Board, it will doubtless soon disappear from the earth.

The cause of malaria was discovered even before that of yellow fever, but its ravages, although greater, were not so spectacular, and its economic loss, although larger, was not so distinctly appreciated as that of yellow fever. Consequently, the fight against malaria was not at first prosecuted with the same aggressiveness. The fight, however, is being aggressively and successfully waged. Already malaria has been driven out of many communities, and no one doubts that it can be driven out of every community. The cost of this accomplishment would only be a small fraction of the economic gain.

About the time the causes of yellow fever and malaria were being discovered, Dr. C. W. Stiles was demonstrating the prevalence of hookworm in the South. Only those who were closely associated with the early days of the hookworm campaign can appreciate the prevalence and the tremendous economic loss due to this trouble. Many families, instead of being producers and assets to a community, were liabilities. Vast numbers had their productive efficiency so reduced as to turn the balance to failure instead of success. The cure of hookworm is easy and its prevention sure and certain.

Of the diseases common to the South and the North, there are two which compete with each other for first place as leaders in the army of death. Together they carry off one-fifth, or more, of all those that die in this country. In each of these the determining factor in producing the disease is not the presence of the germ. It is the lowered resistance due to one or more conditions, a previous depleting disease, lack of fresh air, lack of nourishing food, overwork, crowding in the house or at work and exposure to cold.

In the South the element that chiefly makes for lowered resistance is that which comes from other diseases. With our long season of balmy weather we should have plenty of fresh air. With us food should be, as it is, cheaper and more abundant than elsewhere, for the soil and climate of the South yield food with less effort and less exertion than do other soils and climates. Overwork is not necessary to gain a livelihood. The mild weather gives no excuse for crowding within doors. It would, then, seem reasonable to say that with the elimination of the factors of previous disease, tuberculosis and pneumonia should both be relegated to insignificant places as causes of death.

Hookworm, which I have mentioned, is one of a group which to me is the predominating single problem of the South. This is the filth-borne group which directly and indirectly is responsible for more deaths, sickness and economic loss than the diseases of any other group. The diseases of this group are typhoid fever, the infectious summer diarrhea, dysentery, and the other intestinal parasites. It was found that at the camps during the World War the victims of hookworm were more susceptible than others to pneumonia, meningitis and second attacks of measles; and furthermore, when they contracted a disease their fatality rate was higher.

The victims of hookworm, having a lowered working efficiency, are usually poor and consequently suffer most from the diseases due to insufficient, improper and unbalanced diet.

For many years we have been fighting filth-borne diseases, the class of which typhoid has been accepted as the type; and

the results have been satisfactory so far as they have gone. We have markedly reduced typhoid and the other intestinal ailments. We have less dysentery, less diarrhea and fewer victims of intestinal parasites. Some of the Southern states have typhoid rates that are approximately those of the whole country; and these figures offer an astounding contrast with those of a few years back. But should we be satisfied? I shall not be satisfied until typhoid fever is a stranger to my State, until any one of the communicable bowel complaints shall be so rare as to cause surprise.

The thing that should appeal to all of us engaged in public health work, the thing which is most demonstrable in the prevention of the filth-borne diseases, is the mathematical certainty of results from efforts. If we so dispose of human excreta that particles of it cannot get into the mouths of people we can end the menace of those diseases. Typhoid has virtually disappeared from cities; and it is reasonably safe to say that it would disappear entirely from cities if every inhabitant would properly use a properly constructed toilet.

There is no tenable reason why our country districts should be less immune. Time was, and not so long ago, when our rural sections were far more healthful, when even the typhoid mortality rates were markedly unfavorable to the municipalities. Community sanitation has answered the demand of the city. Individual sanitation must be undertaken by the rural dwellers. No doubt that is harder to put through, but we must continue the task notwithstanding the difficulties.

The group of diseases known as the common contagious diseases of childhood exact a heavier toll than they should. They are not so serious in the warm as in the colder climates. They can be greatly reduced. The vaccine for whooping cough and antitoxin and toxin-antitoxin in diphtheria are great agents in the fight against these diseases. We can make great headway against them by using our opportunities in the schools. These diseases are carried by the secretions of the mouth and nose. There are many mild and unrecognized cases and unknown carriers. It is impossible to reach them all by quarantine measures. By this means we reach merely a fraction of the foci. We should fight these diseases as we are fighting typhoid and malaria. We do not try to get rid of them by isolating the patient with typhoid or killing only the anopheles in the home of the patient. We consider the bowel discharges of all humans as potentially dangerous and safely dispose of all. To prevent malaria we consider all anopheles potentially as carriers and attempt to get rid of all. By this same token, we should consider the secretions from the mouths and noses of all humans as potentially dangerous and try to see that all humans take such precautions, by acquiring proper habits early, that the chances of transferring secretions from one mouth to another are minimized. Just as chances are lessened, so will the incidence of the disease be lessened. This brings us to what I consider to be the next step in public health: that is a greater and more intensive use of the schools in health work.

We can place on our statute books the most drastic laws requiring health precautions and punishing those who disobey the regulations, but I do not believe that any health officer will seriously contend that such laws will accomplish our purpose unless they are preceded by intelligent and intensive education. We must make the people see the reason for rules and the value to them of their observance. If we can through the schools teach the reason of prevention and preach the gospel of health, we can in time, and that not distant, reach all the people.

As an evidence of what has so far been accomplished, I shall quote from a paper read before the Medical Society of Virginia recently by Dr. B. B. Bagby, of West Point, Virginia, a small town of 1800 population. He says:

"I have kept a careful record of all my patients since I began to practice medicine. I moved to West Point in the spring of 1909. It is interesting and surprising to note the change that has taken place in my practice since that time. Recently, I have tabulated all of the town cases that I had during the five summer months of 1909 and compared them with the same five months of 1922. You notice that I say my *town* practice. I have left out my country practice, as the Ford car has made too great a change in my country practice for me to take that into consideration.

TYPHOID FEVER, MALARIA AND CHOLERA INFANTUM DISAPPEAR

"During the five summer months of 1909 I saw 158 town patients. During the same period of 1922 I saw 202 town patients. Of the 158 patients seen in 1909, 96 had well defined cases of malaria, with chills, fever, sweats, etc.; 15 had cholera infantum, ileo-colitis or dysentery with two deaths; and seven had typhoid fever, making a total of 108 cases out of 158 that should have been prevented.

"During the five summer months of 1922 I did not have in town a single typical case of malaria, typhoid fever or cholera infantum. I had one atypical case of malaria that was most probably contracted out of town. I had only one case of ileo-colitis that lasted over five days and this was the only case of dysentery or infectious diarrhea in town this summer. And there has not been a case of typhoid fever in West Point since February, 1919. Dr. A. S. Hudson, the other physician in town, says he has not had a case of malaria, cholera infantum or typhoid fever this summer. So malaria, typhoid fever and infantile diarrhea have about disappeared in West Point, Virginia."

Also, he says:

"I have not found a case of hookworm in five years. When I began to practice medicine in 1904, some sections in King and Queen County showed a hookworm infection of nearly a hundred per cent among the school children, and many adults were sallow, anemic, sick and thin. Thanks to the State Board of Health these same people are now healthy, prosperous and happy. I know of several families of prosperous farmers that are now enjoying touring cars of their own who, a few years ago, on account of hookworm, were more or less dependent upon charity."

When the filth-borne diseases have been banished and the diseases of childhood reduced as they should be, we shall see in the South a race of happy, prosperous, long-lived people inhabiting a country where work is a pleasure and profit is certain. We shall see a people relatively immune from illness, taught to protect themselves against the dangers of infection; virile, strong people, enjoying the gifts of Nature so bounteously bestowed, jealously guarding those gifts, and careful to do nothing to hamper the efforts of Providence. We shall see a wise people, for those who have learned to protect themselves and their neighbors can learn any lesson of cooperation; and whenever Nature and men cooperate toward perfection, life must be a dream of beauty. We shall see in the South an earthly paradise, a measureless and unbroken health resort.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

SURGICAL SENSE*

By Hubert A. Royster, A.B., M.D.,
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The essential idea which forms the topic of this address might be expressed under various titles. From time to time there have been discussed such subjects as surgical judgment, surgical philosophy, surgical instinct, etc. Surgical sense seems to include them all. Call it what you will, there is a background to the surgical picture against which all theory and practice must be reflected straight and true. It is a matter of mental balance and moral control. The great general, the towering statesman, the captain of industry may obtain power by their ability to command other men, but the surgeon's glorious achievement is his command of himself. For in the words of Ellwood Hendrick,† "The greatest triumphs are not to be found in bidding somebody else to do things, but rather in the doing of things ourselves." And he continues: "The lawyer, the physician, the surgeon, the chemist, the man of research, each conquers by his own thought and work."

Above everything the surgeon must be capable of self-control. Beyond other men his mental, moral and physical faculties are taxed to the breaking point, often in such dire emergencies that no time is permitted for preparation. To keep the mind clear and open, to cultivate a fine spirit of right and justice, to have the body and its forces always responsive to the will—surely these are the dictates of good sense. They are the necessary qualities of the well-rounded surgeon.

The intellect of the surgeon is the motive power behind his performance and his decisions; and if his vision is broad, the capacity to acquire or reject knowledge keeps him eternally young though he may be old as the years go. A shut mind does not exist in a safe surgeon.

Character tells in the surgeon's work just as clearly as if his initials were stamped upon every organ or tissue that he touched. The practice of surgery makes one either better or worse; it lifts one up to a realization of humanity and service, or it hardens one into machine-like methods and materialistic views. When he begins to feel the sense of moral values in his work, the surgeon understands his art. Then he will not think that an operation ought to be done because it can be done; he will not represent capital operations as trifling; he will not believe that it is all of surgery to cut or all of operating to get well. But rather will he learn the doctrine of "put yourself in his place," and have the feeling that when a patient places his life in the hands of a surgeon, the surgeon receives far greater honor than he can ever bestow upon the patient—greater even than can be compensated for by the restoration which the surgeon may accomplish.

The surgeon's body is the instrument through which the purposes of his intellect and his will are executed. How needful and resourceful is physical excellence! If it is not present to begin with, it should be cultivated, and what little strength may be existent should be conserved and encouraged. Oftentimes a calm and cool demeanor proceeds from a sound body, which endows its owner with a self-mastery that nothing can disturb. The business of keeping fit includes refraining not only from those things which tear down, but also doing those that build up, the body. I believe that the surgeon should be interested in and should participate in outdoor sports, athletics and all branches of physical education as a part of his concern with the doctrine of "physical morality" and with direct bene-

*Oration on Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

†Harper's Magazine, April, 1919.

fit to himself and his work. In no other occupation are the mental, moral and physical faculties subjected at once to such wear and tear as in the profession of surgery. Let us see to it that the physical man which bears the brunt is equal at least to the other attributes. In addition to "the eye of the eagle, the heart of a lion and the hand of a woman" the surgeon needs the body of a gymnast.

The art of surgery is not a question of mere mechanics. True, there is need for most skilful precision and careful manipulation; to that degree mechanical principles are involved. One of the most capable surgeons I know has not a spark of ordinary mechanical skill; he cannot attend to his own automobile, design a dog kennel or drive a nail. But he exhibits remarkable talent and deftness in using his fingers on human tissue. I think it is the intelligent coordination of brain and hand, the guiding of fingers by brain cells, that makes for perfection in operating. As a man thinketh in his head, so performeth he with his hands. So that "nerve" may be defined as knowing what you are doing, being sure of what is coming next. In surgery familiarity breeds repose.

Neither is the knowledge of anatomy alone the stock-in-trade of a surgeon. The great anatomist usually may not qualify as a surgeon, because he dissects instead of operating, while the great surgeon does not play the part of an anatomist, because it is necessary in his work to sacrifice much of the anatomy. Time was when anatomy and surgery were associated, but, to paraphrase the language of Gilbert in "The Mikado," the surgical anatomist, "I've got him on the list, he never will be missed." Nowadays the anatomical teacher is a pure scientist and runs to embryology, neurology and histology. What is left for the surgeon is compassed in topographical, regional and gross anatomy, learned through operative surgical courses on the cadaver and animal experimentation. All this the finished surgeon must know, and know thoroughly, but he is to keep in mind the purpose of his work; he should understand that the mission of surgery is to heal, to restore, or to remove forever the offending lesion. There can be no half-hearted halting, no hesitation for cosmetic effect or for exhibiting classic dissections. After all, John Ashhurst* was right when he said: "The importance and even necessity of a thorough knowledge of practical anatomy can, indeed, scarcely be overrated; yet it is more essential for the surgeon to be well versed in pathology and therapeutics (or, in other words, to be an accomplished physician) than it is for him to know the attachments of every muscle in the body or all the possible variations of arterial distribution."

To be well versed in pathology means for the surgeon a deep understanding of diseased processes in general and a thorough grounding in the naked-eye appearance of diseased structures as they are seen at the bedside and at the operating table. The frozen section and the microscope are tremendous aids in diagnosis, but they cannot take the place of macroscopic observation. Our technic often depends upon our knowledge of pathology and the one will get us into difficulties if we are not sure of the other.

Of all types the one who shows the least sense is the cock-sure surgeon. Let us ask to be delivered from him. He knows what he will find when he goes in—and unfortunately usually finds it and removes it; he does not make mistakes, because he would not know it if he did; his patients are immune to the catastrophes of surgery, as they do not succumb to any of his operations. Age and experience seem not to change or to mellow the disposition of this individual. What he needs is to realize that "always" and "never" have no place in surgery; that his chief concern in life is to know his limitations and not to attempt things beyond his capacity. Boldness is one of the elements of a surgeon, but this gives no license to "rush in where angels fear to tread."

Avoiding this type on the one hand, let us be careful not to lean too far on the other. Being too timid to do one's whole duty is also reprehensible. Moreover, the hesitant, vacillating mind and the slow, dilatory hands are equally to be condemned. While I agree that "there are many good operators but few good sur-

*"Principles and Practice of Surgery," 1890.

geons," just as steadfastly do I maintain that the chronic operator should be barred. He it is who pats and fondles the tissues out of love for his own prowess; who begins an operation as if he were afraid to approach it and finishes it as if he were reluctant to quit; who appears more concerned with superfluous paraphernalia than with the actual performance of the operation. Truly he presents himself as a disciple of what Joseph Price crudely called "fuss, feathers and foolishness." What can we say of a man who takes all the morning to do an operation that might be done as well in thirty minutes? Is it because he is wiser or more careful than his more prompt colleague? Does he do it better? Rather may we say that, on account of the time consumed, such an operator could not afford enough of that practice which we are told makes perfect. He belongs to the type which an honored confrere of mine dubbed "the occasional operator." Whether a surgeon operates rapidly or slowly he must understand that success will come to him when he believes in safety, simplicity and speed: safety for the patient first, last and all the time; simplicity of technic, so that it may be watched and controlled; speed consistent with conscientious deliberation and familiarity with the procedure. This applies with parallel force to the young surgeon who is proud of the blood spattered on his shirt front as well as to the staid veteran who thinks all is grist that comes to his mill.

The middle ground, where all security lies, furnishes the platform which is built upon a foundation of common sense. There are times when the utmost dispatch is demanded in surgery; there are occasions when calm deliberation must rule. Certain automatic parts of an operation (as, for example, the opening and closing ceremonies) do not, as a rule, admit of delay. With few exceptions the making of an incision and its final suturing should require no conscious mental effort or prolonged manipulation. But the deliberative phase of the operation needs all one's powers of judgment, precision and caution. An operation is a one man job, so far as decision and direction are concerned; a team is necessary to carry on the plan, but it must work as a unit under one head. About the most abominable tactics I know of is consulting and arguing over the open wound. It is as bad as "talking across the board" at a card game. The newspapers may say that "Doctors Jones, Brown and Smith operated on Mrs. Robinson yesterday," but they did not. One of them was the operator and the others assisted; or else, instead of an operation there occurred a composite jumble. Although suggestions may be welcomed and advice be acceptable, a man can become a real surgeon only when he is capable of making his own decisions and doing his own operation.

Finally, let us be thankful that common sense has a place in surgery; that all the training in the universe will not avail without it; that "knowledge comes, but wisdom lingers." There is no one method of doing anything in surgical practice. When we take the best technic that can be used, study the great principles of surgical pathology, bring to perfection the finest manipulation possible in our art, and dilute it all with a sufficient quantity of good sense, then we shall have a remedy for all the ills to which surgery is heir.

THE POST HOSPITAL CARE OF SURGICAL PATIENTS*

By Hugh H. Trout, M.D.,
Roanoke, Virginia

A discussion of this subject naturally divides itself into three divisions:

The first has to do with suggestions given to the family physician, and, in turn, the opportunity offered him to advise with the surgeon regarding the progress of the patient.

The second division concerns directions given the patients before they leave the hospital as to the manner in which they should take care of themselves on their return home.

The last, and perhaps the most important, and certainly the most frequently neglected, has to do with the ascertaining

*Chairman's Address, Section on Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

of the progress of the patient through some follow-up system, which is not too cumbersome.

A recent intensive post-operative study of all of one class of patients admitted to the Jefferson Hospital, Roanoke, Virginia, since its beginning, naturally tends toward a long, tiresome, statistical report, which will not be presented here. Many facts, some encouraging and many discouraging, were revealed as a result of this study, but none so clearly as the necessity for us, as surgeons, to consider the relationship we have to the family physician of our surgical cases, and, in turn, to the kind or unkind feeling that that doctor has toward our surgical work, for be we ever so skillful, without this aid and cooperation, many of our best efforts will be fruitless.

Not until this review of our cases did I know how accurately one could prophesy, in a large percentage of cases, the future mental condition of surgical patients, by knowing the regard of the family physician toward the surgeon. It is surprising how often this state of mind causes the patient to neglect the directions given at the hospital, and thereby produces, in many instances, physical as well as mental injuries.

If we have discovered any peculiarities of the patient these should be communicated to the home doctor. For example, we have all seen patients begging for morphia sleep well with great relief from pain after receiving an aqua puncture. To withhold such information from the doctor who is to watch the progress of the patients on their return home, will often convert a "surgical neurotic" into a morphin habitue. To tell the patient of this finding is almost as foolish as not to inform the doctor. Apart from every other consideration we, as surgeons, often have valuable aid given us by the family physician, information the patient frequently could, but would not impart to us.

The average doctor does not wish to dress wounds, and, if possible, it is far better not to allow the patient to go home until all drainage has ceased. If, however, necessity requires his leaving before such a favorable date, it is well to advise simple clean dressings. If iodin technic has been employed, the family physician should be cautioned not to use bichlorid of mercury. Several years ago we saw a very severe abdominal dermatitis due to our failure to caution against the use of this chemical after we had employed iodin. Certain patients are far more sensitive to this chemical reaction than others, and it is interesting to note how far apart in time we may apply these two chemicals and yet occasionally obtain an intense reaction from the formation of biniodid of mercury.

All of us occasionally see abscesses which form in our incisions after our patients return home; some of us admit it. A red, swollen incision, tender and associated often with fever is always an unpleasant sight to the surgeon, but a far worse view to the family physician, who is often a personal friend of the family. An assurance to our medical friends to the effect that a separation of the skin incision with a clamp will usually release pus and relieve the condition, will be of some comfort.

Many patients will not report to their physicians on their return home, and it has been suggested that we leave some kind of dressing on the incision with instructions for the patient to go to his doctor for its removal, and in this manner insure the home doctor's being in touch with the situation. Of course, to the evil minded, this could be interpretated as an indirect form of "fee splitting," but the truth of the matter is, such a visit is well worth to the patient what the family physician might charge, though our experience has been that he usually makes no charge.

There is no class of cases requiring closer watching after leaving the hospital than those that have had a generalized peritonitis. Both patient and doctor should be cautioned to watch for the development of secondary abscesses and intestinal obstruction.

If all our cancer of the breast cases reported to their family physicians at least every two months after their return home, we should be able to save many a patient who now dies from some local or not far distant recurrence, many of which might yield to heat, radium, x-rays or a combination of all. In a recent article published in *Surgery, Gynecology and Obstetrics*, May,

1922, we were able to collect from literature and our surgical friends, only fifteen cases of cancer of the breast who became pregnant after having had a breast removed for cancer. Thirteen of these cases developed cancer in the remaining breast. Of course, the vast majority of women with cancer of the breast are well beyond the child-bearing period. But with this experience before us, we are derelict in our duty if we do not both warn the patient of this danger, and also urge upon the physician to use his influence with the husband.

In a large number of cases, the most difficult part in the treatment of fractures does not begin until many of the patients have returned home. There seems to be some doubt in the minds of surgeons how much of surgical value we derived from the World War, but I am sure we all agree that the insistence upon early and continued passive and active motion of fractures in and about the joints, has been a real and lasting contribution. We have all seen cases of stiff joints which could have been prevented if the patients had been encouraged to use the parts involved despite some pain. For example, all of us have witnessed an apparently stiff elbow increase in its excursion of motion when some youngster has been made to carry a two gallon pail starting with a quart of water and increasing the amount daily. Unless we surgeons have the kind regard of the family doctor, the little patient is not made to persist in his efforts, and thus the chances of a useful arm are decreased.

Massage, baking, the use of the various lights, etc., have come to stay, and all have their value if correctly applied. These agents are now being demanded by the patients; and, unless we see that they are properly employed, the patients are going to arrange for their improper partial application by chiropractors, osteopaths, etc., much to the detriment of the injured member.

The subject of the late care of fractures is far too large for more than mention in a paper of this type. It is just in this class of cases that the hearty cooperation of the family physician is most urgently needed in order that our patients may obtain the best results, and that visits from a none-too-friendly lawyer be prevented. The x-ray has been of immense value to us in the proper care of fractures, and we should insist upon pictures not only of patients in the hospital, but also at least one, about six weeks after their discharge. While the x-ray has been of much benefit, we have lost much by learning to rely upon this aid instead of also cultivating a study of muscles, their attachments and more particularly their line of pull, such as was possessed by our predecessors in our profession.

There is apparently only one point upon which the advocates of pyloroplasties and gastroenterostomies agree and that is the necessity for very careful medical direction of the patient upon his return home. The sooner we admit that surgery, no matter what the type of operation, offers the patient with an ulcer of the stomach or duodenum only an opportunity to allow medical treatment to be successful, the better off we shall be as surgeons, and the sooner our patients will be converted into individuals capable of enjoying life. About ten years ago I visited a large hospital in one of our middle western cities, and one of the internes showed me a ward of twenty to thirty beds which they called the "gastroenterostomy ward." All these cases had been operated upon at other hospitals. They had returned home, tested out their gastric resistance to all kinds of foods and liquids, and thereby landed in the above mentioned locality, nursing a grudge against surgeons in general and making most uncomplimentary remarks regarding the one in whom they had placed their confidence. Practically none of them would have been in that ward had the operating surgeon sufficiently impressed upon them the great importance of careful diet. A man who often for years has had to deny himself many of the pleasures of eating, finding himself almost suddenly able to satisfy his ravenous appetite without pain, is not in a condition of mind to accept verbal advice urging discretion in diet, and much tact is required to make him promise even to be careful. The following diet list is now handed each patient of this type before his discharge from the hospital. While I do not believe many of them follow it, it does, at least,

give them a basis upon which to regulate their diet. This act also impresses upon them the need of care in selecting their food. Any of this list must, of course, be taken in moderation.

DIET LIST

Soups—Any light soup.

Meats—Any of the easily digestible meats as sweetbreads, beef, mutton, lamb or poultry (best minced, and then taken either broiled or boiled).

Breads—Toast, Graham, corn bread, cold white bread.

Cereals—Oatmeal, Cream of Wheat, Hominy Grits.

Fish—Any of the white varieties—Oysters (broiled or boiled).

Eggs—Any form, except fried.

Vegetables—Peas, white potatoes, spinach, asparagus—best taken mashed and strained.

Desserts—Any of the light puddings, plain ice cream, gelatin, custards.

Fruits—All, but mainly stewed.

Fatty Foods—Cream, butter and olive oil.

Drinks—Milk, buttermilk, cocoa, weak coffee, weak tea and water.

The following foods must be avoided:

Rich soups, fried foods, pork, veal stews, hashes, corned meat, potted meat, twice cooked meat, liver, kidney, duck, goose, sausage, crabs, sardines, lobsters, preserved fish, smoked fish, salted fish, salmon, cauliflower, celery, radishes, cabbage, cucumbers, sweet potatoes, tomatoes, beets, corn, salads, bananas, melons, berries, pineapple, hot bread or cakes, nuts, candies, pies, pastry, preserves, cheese, strong tea, strong coffee, any alcoholic stimulant.

The question of the amount of exercise to be taken is one which differs somewhat with each individual case. In general terms it may be said, "With the young restrain, and with the old encourage." Going up and down steps apparently is the gauge by which most patients measure their return to their usual life. Patients should be allowed to try their strength upon the steps as soon as they feel that they are able to do so. The ill applied efforts of friends to assist more often hinders than helps in such cases.

The important part played by the teeth in focal infections makes it imperative that the patient with defective or decayed teeth or gums should be advised to see his dentist at as early a date as is possible. Hence, a card with the following printed on it is handed him: "Your mouth needs the attention of a dentist. See your family physician concerning the time and the dentist you should see."

A patient who has had a gynecological operation should not become pregnant for at least three months. It is in this class of cases that the aid of the family physician is needed as much as anywhere else; for the person from whom the patient and her husband are going to take advice is the doctor they know best, and this, as a rule, is not the surgeon.

A hot douche should be given at least once a day, for the cleansing effect, if nothing else. We have found the following satisfactory:

Pulv. aluminis .....oz. i
Ac. borici .....oz. iv
Phenolis .....dr. iii
Ol. menth. pip. .....dr. iss

Apparently very few women know how to take a douche properly. We instruct them to lie down, insert the nozzle as far as they can, so that the water may go as high in the vagina as possible, and to use at least two quarts of water.

A douche is very necessary for these cases who have had radium applied to the cervix. It is also highly important that these cases be examined frequently and instructed to return to the hospital upon stated dates.

The prostate cases can often be made far more comfortable if they are instructed to increase their bladder capacity by holding their urine as long during the day as they can. By carrying out this simple suggestion the bladder is often greatly dilated and the patient's nights are made far more comfortable. Of course, while it is important to make these old fellows drink very freely of water, they should do so in the morning, so that their bladders will not fill at night.

Books have been, and many more could be, with profit, published concerning the hysterical, neurotic and neurasthenic patients some of whom unfortunately fall

into our hands. Woe be to the surgeon who performs an ill-advised operation upon one of this class of patients.

We all know of the various types of "groups," "clinics," etc., consisting of surgeons, gynecologists, orthopedic surgeons, eye men, nose men, throat men, ear men, internists, pathologists, radiologists, and many other additions too numerous to enumerate, but none of us has heard of a "group" containing the family physician. Doubtless much good has come from this type of practice, but until the family physician is made to feel a part of that system, and actually know its workings the patient will not be satisfied upon his return home. After the many, sometimes useful, examinations he is confused, and does not know who is in charge of his case. We have all seen volumes of copies of examinations sent to the family physician, containing many words that the average man has to employ a dictionary even partially to understand, full of veiled suggestions of the almost infinite capacity of the "group" making them, without a word in common sense terms suggesting definite care to be employed upon his return home. He returns feeling, after having had such unusual events crowded into his usual easy going life, that his family physician is no longer competent to direct his case, and without this guide he (or she) is soon lost both physically and mentally.

The second division of this paper, as previously stated concerns instructions given the patient. We feel that no matter how well intended verbal directions are, these cannot be so effectual as written ones. We have these directions printed and handed to the patient before his discharge. Some patients require the above mentioned diet list. Every patient who has had a laparotomy wishes to know if his appendix has been removed, so we have a little card stating "Your appendix has been removed," or "Your appendix has not been removed," as the case may be, placed in the envelope.

If a surgeon forgets to tell a patient concerning the introduction of a small cervical dilator, he sees a troubled patient when it comes out of its own accord, especially if this event should happen as she is walking along the street. For this, and other reasons, we insert in the envelope a card with the following: "A small, black, hard rubber dilator has been left in you. It should come out in less than three months. If it does not, kindly notify us." At the bottom of each set of directions will be seen a few questions below the perforated line. The questions are to be answered and placed in the addressed, stamped envelope which is in the larger envelope containing the directions, diet list, etc. In this manner the patients send uniform desired replies at stated intervals. These envelopes are assembled in the operating room and go to the chart room on the halls having the patient's name on the outside, to be given the patient a few days after the operation. The top of the slip, above the perforated line, is filed with the patient's chart, to allow a check to be made in seeing that every patient has received the proper list.

Mrs.....

GYNECOLOGICAL CASES
(Married Women)

Report on your return home to your doctor. He has been written about your operation and can and will advise you about anything you should know.

Lie down in the middle of each day for about one hour. Keep this up for at least two months. If you cannot do this at least go to bed early and arise late.

You may go up and down the steps as you feel able to do so, but be reasonable.

Do not wear any binders or supports. Return to your usual corset if you wear one.

Take water freely internally, externally and eternally, for drinking pure water "flushes out" your system, and taking baths is necessary and will not hurt your incision, and you should continue this the rest of your life.

Eat fruits, vegetables, etc., to help regulate your bowel movements, but, if this is not successful take white vaseline at night. Start with two teaspoonfuls every night and increase or decrease as indicated.

Do not take purgatives unless prescribed by your physician. Obtain all fresh air possible.

Avoid all rough driving, unusual exercises, or any other act you might find painful.

Remember you have been sick and do not try to show your community how soon you can do foolish acts, but try to be prudent at all times.

Do not do any house work for at least one month—six months is better.

You should not become pregnant for at least six months—one year would be better.

Until all soreness has disappeared from the parts operated upon your sexual relations should not be resumed.

Some slight menstrual irregularities are expected for a few months and such should not worry you.

You should take one hot douche a day for six weeks, and then several every week.

Kindly mail the attached slip at the end of three months. It might be of help to you and it certainly will be to us.

Do you regard yourself as having been improved by the operation .....

Have you gained in weight? If so, how much?.....

If not, how much have you lost?.....

Give information regarding menstruation.....

Have you been keeping up your douches?.....

Any other information .....

Name .....

Address .....

M.....

CANCER OF BREAST CASES

Report on your return home to your doctor. He has been written about your operation and can and will advise you about anything you should know.

Lie down in the middle of each day for about one hour. Keep this up for at least two months. If you cannot do this at least go to bed early and arise late.

You may go up and down the steps as you feel able to do so, but be reasonable.

Take water freely internally, externally and eternally, for drinking pure water "flushes out" your system, taking baths are necessary and will not hurt your incision, and you should continue this the rest of your life.

Eat fruits, vegetables, etc., to help regulate your bowel movements, but, if this is not successful take white vaseline at night. Start with two teaspoonfuls every night and increase or decrease as indicated.

Do not take purgatives unless prescribed by your physician.

Obtain all fresh air possible.

Avoid all rough driving, unusual exercises, or any other act you might find painful.

Remember you have been sick and do not try to show your community how soon you can do foolish acts, but try to be prudent at all times.

Return to Hospital at end of month from time of your departure for further x-ray or radium treatment.

Do not become pregnant.

Use your arm freely in spite of pain which can often be relieved by baking or by heat in any form.

Kindly mail the attached slip at the end of three months. It might be of help to you and it certainly will be to us.

Are you having trouble with your arm?.....
If so, what?.....
Has your wound entirely healed?.....
Is your scar painful?.....
Any other information.....
Name .....
Address .....

M.....

FRACTURES

Report on your return home to your doctor. He has been written about your operation and can and will advise you about anything you should know.

Lie down in the middle of each day for about one hour. Keep this up for at least two months. If you can not do this at least go to bed early and arise late.

Eat fruits, vegetables, etc., to help regulate your bowel movements, but, if this is not successful take white vaseline at night. Start with two teaspoonfuls every night and increase or decrease as indicated.

Do not take purgatives unless prescribed by your physician.

Obtain all fresh air possible.

Avoid all rough driving, unusual exercises, or any other act you might find painful.

Remember you have been sick and do not try to show your community how soon you can do foolish acts, but try to be prudent at all times.

If the fractured part is not doing well in any way, you should either return to Hospital or be certain to consult your physician.

If possible, we should like for you to return to the Hospital for another x-ray as well as an examination in one month's time from your departure.

Follow instructions given you at Hospital as regards use of fractured part.

Kindly mail the attached slip at the end of three months. It might be of help to you and it certainly will be to us.

How much use do you have of the fractured part?.....
Have you had x-ray taken since leaving hospital?.....
Any other information.....
Name .....
Address .....

M.....

ABDOMINAL CASES

Report on your return home to your doctor. He has been written about your operation and can and will advise you about anything you should know.

Lie down in the middle of each day for about one hour. Keep this up for at least two months. If you cannot do this at least go to bed early and arise late.

You may go up and down the steps as you feel able to do so, but be reasonable.

Do not wear any binders or supports. Return to your usual corset if you wear one.

Take water freely internally, externally and eternally, for drinking pure water "flushes out" your system, taking baths are necessary and will not hurt your incision, and you should continue this the rest of your life.

Eat fruits, vegetables, etc., to help regulate your bowel movements, but, if this is not successful take white vaseline at night. Start with two teaspoonfuls every night and increase or decrease as indicated.

Do not take purgatives unless prescribed by your physician.

Obtain all fresh air possible.

Avoid all rough driving, unusual exercises, or any other act you might find painful.

Remember you have been sick and do not try to show your community how soon you can do foolish acts, but try to be prudent at all times.

Kindly mail the attached card at the end of three months. It might be of help to you and it certainly will be to us.

Do you regard yourself as having been improved by the operation?.....
Have you gained in weight? If so, how much?
If not, how much have you lost?
Is your scar painful?.....
Have you had any recurrence of the trouble for which you were operated?.....
If so, in what way?.....
Any other information.....
Name .....
Address .....

An essay upon this subject can, at best, touch very lightly upon only a few of the many important problems concerning surgical cases on their return home. If anything which has been said will make a few of you give more serious consideration to the problems of the patient, and to the difficulties of the family physician after the patient leaves the hospital, then what effort I may have spent in the preparation of this paper will not have been in vain.

THE FUTURE OF ORTHOPEDIC SURGERY IN THE SOUTH*

By Wm. Barnett Owen, M.D., F.A.C.S.,
Louisville, Ky.

The future of orthopedic surgery in the South is in no small degree dependent upon the efforts of the Orthopedic Section of the Southern Medical Association in securing better contact between the general profession and our specialty on the one hand and between the public and the orthopedic surgeon on the other. Our opportunity to render fullest service and to develop our work to the greatest good of the community must depend in a great measure upon the understanding which these two groups can be brought to have of our aims and our methods.

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*Chairman's Address, Section on Orthopedic Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

The present tendency to decry over-specialization in medicine has its origin from the manner in which specialism is often achieved. The self-styled specialist, who is specializing rather in higher fees and easier work than in more expert service, is bound to work an injury not only to his own chosen field, but to all medicine. Possibly in orthopedic surgery more than elsewhere is it essential that the training be thorough and the special skill genuine, and founded upon a broad grasp of the underlying principles. Mere knowledge of the routine will not suffice, since the daily run of cases differs too widely from those in the book. What two fractures were ever exactly alike, or called for precisely the same handling?

To insure success from the standpoint of accomplishment the orthopedic surgeon must first know medicine and the sciences upon which it is founded. Particularly must he know anatomy and physiology. His grounding in general medicine must be as thorough as if his aim were internal medicine rather than a branch of surgery. Likewise, he should have that knowledge of general surgery and of surgical therapeutics which only a prolonged service in a good general hospital can give him. Then, and then only, should his special training in orthopedic surgery commence. Of this special work one can say only that it can not be too thorough or too practical. A part of it may, and must, be in the shape of formal teaching, but very much of it must come through personal handling of a large amount of clinical material. Our problems are so ever-changing, our cases so regularly irregular that the man who does not in the course of his training discover a large measure of resourcefulness and initiative had better turn to some other and easier field.

But let the orthopedic surgeon in the making beware of regarding his cases simply as so much clinical material. Frequently the crippled boy is inhabited by a crippled mind, which completely fails of normal adjustment to its environment, and in no field of medicine is tact, intelligent sympathy, discernment and a sound judgment of human values more essential. The truly successful orthopedic surgeon is never merely an orthopedist. He must be in the broadest sense a physician who practices orthopedic surgery.

To turn from training to practice, the orthopedist's measure of accomplishment, presuming always the ability to accomplish, must depend largely upon his bringing to others the knowledge of what he can do. Particularly must he show the general medical man what measure of relief he can give. He can scarcely be expected of his own curiosity to keep abreast of orthopedic progress; yet it is to him that practically every orthopedic case comes before it reaches the orthopedic surgeon.

As orthopedic surgeons and not as individuals, it is our duty to educate the public, and particularly those of the laity who have the overseeing of large industrial and social problems. In how many rural, or, for that matter, city communities, are there scores of cripples who could be made, or at some stage of their illness could have been made, useful members of society by the timely application of our art. Can any one calculate the days, months and years lost to the workingmen of this section of the country through improper or ill-judged handling of industrial injuries? Yet these unfortunates are not neglected through willful malice, nor because their treatment is not economically feasible, so much as from the fact that those immediately responsible for them are not aware of what could be done. Let us not feel that it is beneath our dignity, or that it smacks of too much of personal advertising, to present general orthopedic problems before lay organizations when the opportunity offers. By so doing we shall not only be rendering a real service to the orthopedic surgeons of the South and their successors of the future, but to our moral charges, the crippled child and the injured workingman. We should feel that we are engaged in a work of rehabilitation which, while it lacks the emotional stimulus of war, is far more vast and important than the similar problem arising from the recent conflict.

We should be careful not to dismiss our cases too early. We must provide a means for bridging that tiresome gap between the final removal of dressings and the ultimate ability to resume normal work or activity, and we should emphasize those

means which tend to shorten this period. The various forms of physical therapy have in the past been greatly neglected and have been allowed to become in a great measure the property of the quack and drugless healer, yet these methods properly applied and judiciously followed are capable of saving days of disability and hours of pain. Restoration of function and avoidance of deformity are our primary objects and nothing must be allowed to jeopardize the attainment of either, but time is also a major factor to many of our patients. The patient should be under observation and control, and this usually means under active treatment, until the time that he returns to work, if that be possible, or until he has received the maximum benefit to be derived from orthopedic attention. We should leave him neither the excuse nor the inclination to turn to the chiropractor or the ill-trained masseur for the completion of our task.

The manifold evils arising from bad posture must be prevented largely by the education of the mother and the teacher. No one who has lived through the campaign against diseased tonsils and adenoids can doubt the efficacy of such a course. When it shall be generally known by parents and educators that faulty posture is quite as much a menace to health as diseased tonsils, perhaps school nurses will be trained to recognize and report these defects.

We need orthopedic sanatoria or convalescent homes almost as much as we need tuberculosis sanatoria. Neither in the home nor in the general hospital can those of our patients who require it receive that prolonged special attention needful to attain the best results. Ideally such institutions should be staffed by specially trained orthopedic nurses and equipped with all the modern paraphernalia for physio-therapy, occupational therapy, helio-therapy, etc.

The surroundings, the fees and the accommodations should make it not only possible, but as nearly as may be agreeable, for patients to spend months or if necessary years in these institutions.

I realize that there will be no general agreement as to the relative importance of our problems; and that we are but starting upon a long and difficult road. If these remarks serve to stimulate discussion and thought, and if through them any constructive policy is brought about or stimulated, they will amply have served their purpose. In the last analysis, the future of orthopedic surgery in the South rests upon the broad shoulders of the members of this Section and their professional confreres. Founded upon their sincerity and honesty of purpose and their enthusiasm for their chosen work, I see no reason why its achievements should not ultimately rival or surpass those of the Northern section of the country, where this specialty had its beginnings.

In conclusion, I offer the following suggestion for this Section:

That we change the name of the "Section on Orthopedic Surgery" to the "Section on Bone and Joint Surgery," following the successful lead of the *American Orthopedic Journal.*

It is more comprehensive. It would attract a larger group of men interested in the same subjects, and eliminate a repetition of papers.

THE RAILROAD SURGEON: PRESENT, PAST, AND FUTURE*

By Lucius E. Burch, M.D.,
Nashville, Tenn.

The Southern States Association of Railway Surgeons was organized in 1915 by my friend and colleague, Dr. Duncan Eve. In a period of seven years its membership has steadily increased. It has contributed to the profession many scientific and practical papers and has accomplished much along the lines of sanitary and public health measures. This Association represents the railroad surgeons of sixteen states and its influence is capable of establishing standards for those who are engaged in railroad or industrial surgery throughout the country.

Railroads are not one hundred years old. The first charter taken out was by the

*President's Address, Southern States Association of Railway Surgeons, Auxiliary of Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Baltimore and Ohio Railroad in 1827 and its first 15 miles were completed and operated in 1830. It is almost impossible to realize the great progress that has been made in less than ninety-three years. This country owes to the railroads its prosperity and success in agriculture, manufacture, mining and other industries too innumerable to mention. It was a long step in a short time, from the first crude train on the B. and O. pulled by horses and mules to the present train de luxe in which one may travel in the lap of luxury from the Atlantic to the Pacific and the Gulf to the Great Lakes in a brief space of time. The history of railroads in this short time is interesting. Until fifteen years ago the roads brought in huge profits to their shareholders and they controlled, to a great extent, the destinies of the Nation by their activities in county, state and National affairs. Today not a small percentage of the roads of the country are in the hands of receivers and very few are even making expenses. Government aid has been given in many instances and justly so, otherwise many of our great arteries of commerce would have been wiped out. They are now fighting for an existence which has been brought about by an unjust public opinion, the meddlesome interference of National and state boards and the huge demands of the labor unions.

A surgical and medical department was created with the first railroad and on account of the occupational hazard of the employes it is considered an important department of any well recognized road of today. Railroad surgeons in the past have not received due credit for their work by the railroad operators, but a new era has dawned and the old order is rapidly changing.

The annals of our profession will show deeds of heroism, self-sacrifice and benefits conferred upon others that are unequaled in any other profession. Since the facts are not known by our own profession—how can we expect the public at large to know them? It is estimated that 60,000,000 people died of small pox in the Eighteenth Century. In Mexico in the Sixteenth Century 3,500,000 died of small pox. This dreaded disease is now a thing of the past. The majority of the younger members of the profession have never seen a case and yet in the halls of fame of all nations does Jenner, who stopped this dreaded scourge, rank with the noted soldiers, sailors and statesmen? No, and 98 per cent of the people of the world have never heard of Jenner. In less than a hundred years anesthesia, aseptic and antiseptic surgery, the eradication of yellow fever, malaria, typhoid, cholera, bubonic plague, diphtheria and the prevention of lock jaw and hydrophobia, all were accomplished. Yet the men who brought all this about will not rank in the history of the Century with Grant, Lee, Lincoln, Disraeli, von Hindenburg, Joffre, Foch, Pershing or Haig.

The public generally is beginning to realize the necessity of a thorough medical education. Thirty years ago there was a great apathy in this direction. Dr. Wm. H. Welch, in 1893, found that the permanent investments yielding revenues to medical schools was only $600,000, while the endowments of theological schools was $17,600,000. Since then the tide has turned and many medical schools have been richly endowed, one school in this State alone now having a total endowment of eight million dollars.

The railroad surgeons fifteen or twenty years ago were often selected with some consideration of their political influence in their various communities rather than entirely because of high professional attainments and standards. They were given a meager fee for their work. On a number of roads they gave their attention gratis, the only compensation being a pass over the line that employed them. They were supposed to assist and work under the claim agent in settling doubtful cases and to appear as witnesses in behalf of the road in cases going to trial. This state of affairs is ancient history and now no fairer body of men can be found than the present executives at the heads of the great systems of the country.

The American Railway Association, whose object is by recommendation to harmonize and coordinate the principles and practices of American railroads with respect to their construction, maintenance and operation, has created a Medical and Surgical Section. Dr. D. Z. Dunott, your

former President, is Chairman of the Committee of Direction, and Dr. Duncan Eve, a former President and founder of this Association, is Second Vice-Chairman. The Medical and Surgical Section of the American Railway Association has appointed committees of the following sanitary code: Physical Standards, Hospital Standards, Prevention and Control of Occupational Diseases and Hazards, Water, and Hernia. Much good has already been accomplished by the creation of the Medical and Surgical Section. It has as affiliated members the various railroad surgical and medical societies. It gives these bodies an opportunity to present their views to the railroad executives, and on the other hand it gives the executives an opportunity to adopt needed methods in surgery, medicine and public health. At the last meeting in St. Louis, in June, your able Secretary appeared before the Medical and Surgical Section of the American Railway Association and in no uncertain terms made known the wants of this Association.

The success of the surgical and medical departments depends upon the work of the local surgeons. They should, therefore, be selected according to their professional attainments and their standing for integrity and sobriety in their communities. A local surgeon should be loyal to the road he represents. He should take a keen interest in its welfare and he should keep a close supervision over the station, shops, toilets, restaurants and houses of the employees and see that they are kept in a sanitary condition. He should know thoroughly the manual of first aid and should instruct those under his supervision in its employment. He should be looked upon in his community as the representative of the road and in all of his dealings he should attempt to bring about a fair understanding between the road, its employes and the public at large. A man of this description is entitled to a fair remuneration for his services. He should by all means receive exchange transportation over other lines to attend medical societies and clinics and his family should be allowed a limited number of trip passes over the line he represents. A railroad surgeon, either local, division or chief, should not be expected to take any part in the settlement of claims nor should he be expected to act as a witness in those cases in which he knows the road is at fault.

A new era is at hand. The railroad executives are willing to meet us more than half way. They are desirous of obtaining and carrying out the suggestions of the railroad surgeons. Let every member of this Association strive, to uphold traditions of the great profession that we represent and let us all endeavor to place railroad surgery upon the highest professional plane.

TORSION OF APPENDICES EPIPLOICAE, WITH REPORT OF A CASE*†

By Samuel Orr Black, M.D., F.A.C.S.,
Spartanburg, S. C.

The appendices epiploicae are folds or pouches of peritoneum, formed from the serous coat of the large intestine containing a varying amount of fat. In obese persons the fat content is often quite considerable. In very thin persons it is almost negligible in amount.

Their shape varies between flat and cylindric, depending upon the quantity of fat contained in them.

"They appear in rows, and their base is attached as a rule to the anterior and posterior inferior longitudinal muscle fibers," or tenia coli. Their apex or distal end generally hangs free, unless attached to some intra-abdominal structure by adhesions.

The length of one of these little fatty projections varies from 5 cm. to several inches, but more nearly averages 3 to 5 cm., and their circumference varies with the amount of adipose tissue contained within the serous envelope.

They are found along the entire course of the colon from the cecum and occasionally from the appendix to the lower end of the sigmoid. Rarely are they seen on the rectum.

It is stated that but a single artery and vein enters and leaves each of these fat tags (Hunt).

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*From the Mary Black Clinic.

†Read in Section on Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

They are more frequently involved, pathologically, as a process secondary to acute diverticulitis, or as a process secondary to the changes in the contents of a hernial sac, than as a process primary in itself.

Diverticula of the large bowel are of two types, congenital and acquired. The congenital diverticulum is one whose wall is made up of all the layers of the bowel wall. The acquired diverticulum is one whose wall lacks the muscular coat. It is a protrusion of the mucosa through the bowel wall, usually at the site where the artery perforates the muscular coat; and the mucosa lies immediately beneath the serosa. It has been spoken of as a "blow out" of the mucosa, or inner tube of the intestinal wall.

Congenital diverticula rarely cause symptoms. Acquired diverticula not infrequently cause symptoms and many of the acute cases, if left alone, become chronic and tend to cause a partial intestinal obstruction, producing a symptomatology not unlike that of malignancy.

At the beginning, there is always a direct communication from the lumen of the bowel into the cavity of the diverticulum. Thus it is that feces and other intestinal contents have ready access into these tiny recesses or pouches, and should a portion of the fecal stream enter them, and then dry and harden, it is possible for this fecolith to ulcerate the mucosa, and thereby set up an inflammatory change which will involve the entire diverticulum. Such a process is called diverticulitis. Through microbic invasion the peri-diverticular structures are involved and peri-diverticulitis results. In this way the appendices epiploicae become involved as a process secondary to diverticulitis.

In like manner, when one or more of the appendices epiploicae are caught with a loop of the large bowel in a hernial pouch, which in turn strangulates or incarcerates its contents, the appendices epiploicae are likewise subjected to the same mechanical and inflammatory changes as are the rest of the hernial contents.

That an appendix epiploica can be diseased in itself and thus constitute a definite clinical entity is not well known. The case herein reported is typical.

Dr. H. R. Black, my father, of Spartanburg, S. C., is a rather large man, 73 inches tall, and weighing approximately 200 pounds. He is beyond 60 years of age, and a man of a very rugged constitution.

On the afternoon of June 4, 1921, after serving as an active pallbearer at the funeral of a lifelong friend whose casket was very heavy, he suddenly felt a rather severe pain in the mid left abdomen, which disappeared almost as soon as it came on.

Some four or five hours later he was bothered with an indefinite soreness through the left lower abdomen, which disappeared upon recumbency. He slept soundly and awakened the following morning feeling well.

He had not long been out of bed before the soreness returned about 2 inches to the left of, and 2 inches below, the navel.

This hung on during the forenoon and became slightly accentuated after completion of a tedious and rather difficult laparotomy toward the middle of the day. Late that afternoon a long automobile trip still further aggravated the discomfort.

The following morning the soreness was lessened, but that afternoon it returned, became rather severe, and he went to bed.

That evening he was seen by several physicians, who were unable to make a diagnosis. All laboratory examinations were negative.

At 9 o'clock the next morning he felt perfectly well except for the soreness and perhaps some tenderness on pressure. There was no nausea or vomiting. The temperature was normal and the bowels had moved. There was no distention and the tongue was clean, but the leukocyte count was 9000.

At 3 in the afternoon the leukocyte count was 10,000 and there was unquestionable tenderness on pressure over the left mid and lower abdomen.

The next day, at about 10 o'clock in the morning, the fourth day since the onset, the temperature was 99°, the white blood cells 11,200, and the soreness and tenderness had distinctly localized over a point on the left side corresponding to McBurney's point on the right. It looked like a typical left-sided appendicitis.

Dr. LeGrand Guerry, of Columbia, S. C., saw him in consultation and thought there might be a mass in the left abdomen, though he could not be positive owing to the extreme thickness of a very fat abdominal wall.

It was decided to operate and Dr. Guerry made a mid-left abdominal incision after the method of Kammerer. Lying immediately beneath an edematous peritoneum, almost completely encompassed by the left border of the omentum, was a large bluish-black mass the size of an orange. It was rapidly becoming gangrenous and when isolated was found to be an appendix epiploica, attached to the lower portion of the descending colon. Its pedicle was twisted several turns upon itself. The pedicle was clamped, cut and ligated,

the mass removed, the wound closed in the usual way without drainage and the convalescence was uninterrupted.

In the literature there have been reported but 16 cases of true torsion of the appendices epiploicae within the abdominal cavity. This case makes the seventeenth. Each of the sixteen presented symptoms of an acute abdomen, as did our own, for which laparotomy was performed. The torsion was the only pathological condition found.

The pathological changes apt to occur in an appendiceal tag are mechanical to begin with, as a rule. Torsion of its pedicle with a concomitant interference with its blood supply will cause swelling, edema, hemorrhage and fatty degeneration, with cystic transformation, gangrene, or abscess formation. One case has been reported where a portion of the periphery of the tag through an inflammatory condition had become attached across a coil of the bowel, thus causing an intestinal obstruction.

In addition to the two above mentioned types of pathology, it is possible for the fatty content to become a true lipoma and grow as such until from its unusual size it produces mechanical symptoms. We have found no such case reported. Another possible transformation is calcification, which has been found at necropsy.

In addition to the 17 cases above referred to, in which the lesion was primary to the appendices epiploicae themselves, there have been reported but 37 other cases in which it was supposed that the pathology presented was due to an inflammatory condition secondary to an acute diverticulitis, or where the torsion was found in conjunction with the torsion, incarceration or strangulation of a loop of bowel in a hernial sac, or where foreign bodies were found free in the abdomen. In the last mentioned case no certain proof existed that the foreign bodies originated in one or more of the appendices epiploicae except in one specific instance.

Of these 37 according to Hunt, who has made an admirable classification of them, 12 were foreign bodies lying free in the abdominal cavity. Ten were cases of true torsion found within a hernial sac. Fourteen were inflammatory, as part of a general inflammation, found in hernial contents, and one was found to have been the cause of a case of chronic intestinal obstruction, as a long slender tag had crossed the front of the sigmoid and there anchored itself, thus constituting a constricting band.

From this brief analysis, it is seen that in the first place the appendices epiploicae themselves may give rise to a definite clinical entity. In the second place, pathological involvement of these structures is a very rare condition, since only 54 cases, 11 of which are questionable, have been reported up to the present time. And, in the third place, the pathology and symptomatology vary with the etiology and location of the diseased tag.

They have been mistaken for appendicitis, acute and chronic, for cholecystitis, with and without stone formation, for salpingitis, for acute diverticulitis, or for acute and chronic intestinal obstruction. So far as we have ascertained, not a single case was correctly and positively diagnosed prior to operation.

In conclusion, we wish to express our thanks to Dr. Guerry for his surgical skill and successful operation, and to Drs. Boyd, Sparkman, and Coan, of Spartanburg, for their expert assistance to Dr. Guerry during the operation of the case.

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EYE, EAR, NOSE AND THROAT

CERTAIN ANATOMICAL AND PHYSIOLOGICAL CONSIDERATIONS BEARING ON HETEROPHORIA*

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The four rectus muscles are a little over 40 mm. long; the inferior oblique is shorter, and the superior oblique much longer. However, if the length of the tendons is deducted, all the muscles have about the same length, not far from 36 mm. Physiologists estimate that muscles can shorten about one-third when contracting to the maximum degree. This gives about 12 mm. as the maximum excursion in any direction from the primary position of which the ocular muscles are capable. Now 12 mm. is just the radius of the eyeball, 24 mm. being usually taken as the average diameter. As is well known, the radius is one-sixth of the circumference, or rather is equal to one side of a hexagon inscribed in a circle. Therefore, it subtends 1/6 of 360°, or 60°. Thus if one of the muscles pulled the eye through an excursion of 12 mm., it would equal a rotation of very nearly 60°. As a matter of fact, the maximum rotations are variously estimated at 45 to 50°.

As has been frequently pointed out, the reason the eyes do not rotate over 45, 50 or 55° is not because the muscles are deficient, but because of the check ligaments. These have to prevent greater rotations which would pull unduly on the optic nerve, the ciliary nerves and arteries, the vortex veins, and, in short, everything that is attached to the globe and has to move with it. Do not deceive yourself with the idea sometimes advanced that in measuring with a tropometer the maximum rotations of the eye in a case of heterophoria, you are measuring the strength or capacity of the muscles. The muscles could rotate the eye further if they were not prevented. They are prevented by the check ligaments, not by their weakness.

Next, consider the size of the muscles in width and thickness, that is, in cross section. They vary from 17 sq. mm. for the internal rectus to 12 for the superior rectus (Volkmann). Physiologists estimate the contractile power of striated muscle as 62.5 grams per sq. mm. (Weber, Haughton), although some put it much higher. At this rate the ocular muscles should have a strength of 750 to 1000 grams, provided the whole muscle contracted. Now, the eyeball weighs less than 8 grams, and so it would seem as though these muscles were amply strong enough to move so light a body which moves so easily. Notice also that most of the muscles of the body are so inserted that they pull upon the short arm of the lever, and so have less power. For example, the biceps is inserted into the radius so near the elbow joint that to sustain a hundred pounds in the hand with the forearm horizontal requires a pull of over a thousand pounds by the muscles. But the ocular muscles are so attached to the eyeball that they always pull at the end of a diameter, therefore tangent to the globe, and so at the maximum mechanical advantage.

On the other hand, the movements of the eye are so rapid that much more force is required than would otherwise be the case. Thus, the time required to rotate 10° is 0.039 second; for 20°, 0.055 second; and for 40°, 0.1 second (Dodge). The following calculation, which shows how much force is required, was kindly furnished by Professor Arthur E. Kennelly, of the Massachusetts Institute of Technology, recently Exchange Professor with France:

A uniform solid sphere 24 mm. in diameter (radius 1.2 cm.) is pivoted with negligibly small friction on a vertical axis passing through its center. It weighs 8 gm. It is set in motion and stopped by the application of a constant horizontal torque, first forward and then backward, so as to accelerate the sphere uniformly to a maximum angular velocity and then to decelerate it uniformly to rest. Required the magnitude of the torque necessary to produce a given

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angular displacement in a measured interval of time.

(1) A 10-degree displacement in 0.04 second.
10° = 0.175 radian in 0.04 sec.
5° = 0.0875 radian in 0.02 sec.

Average angular velocity during the motion is 0.0875 ÷ 0.02 = 4.375 radians per sec.

The maximum velocity at the end of the motion = 2 x 4.375 = 8.75 radians per sec.

The steady acceleration from rest to end of motion = 8.75 ÷ 0.02 = 437.5 radians per second every second ..... (a)

The moment of inertia is $I = \frac{2}{5} M r^2 = \frac{2}{5} \times 8 \times 1.2^2 = 4.66$ gm. cm^2.

The steady torque required for 0.02 sec. is then I a = 4.66 x 437.5 = 2040 dyne perp. cms. = 2.08 gm. p. cms.; or 2.08 grammes acting at a radius of 1 cm.; or *1.73 grammes acting at an equatorial radius of 1.2 cm.*

(2) A 20-degree displacement in 0.055 second.
20° = 0.349 radian in 0.055 sec.
10° = 0.175 radian in 0.0275 sec.

Average angular velocity during the motion is 0.175 ÷ 0.0275 = 6.36 radians per sec.

The maximum angular velocity at the end of the motion is 2 x 6.36 = 12.72 radians per sec.

The steady acceleration from rest to the end of the motion is 12.72 ÷ 0.0275 = 463 radians per second every second ..... (a)

The steady torque required during 0.0275 sec. is 463 x 4.66 = 2160 dyne perp. cms. = 2.2 gm. perp. cms.; or *1.83 gm. acting at an equatorial radius of 1.2 cm.*

(3) A 40-degree displacement in 0.10 second.
40° = 0.698 radian in 0.1 sec.
20° = 0.349 radian in 0.05 sec.

Average angular velocity during the motion is 0.349 ÷ 0.05 = 6.98 radians per sec.

Maximum angular velocity at the end of the motion is 2 x 6.98 = 13.96 radians per sec.

The steady acceleration during the motion is 13.96 ÷ 0.05 = 279.2 radians per second every second.

The steady torque needed during the motion is 279.2 x 4.66 = 1300 dyne p. cms. = 1.32 gm. p. cm. = *1.1 gm. weight at equatorial rad. 1.2 cm.*

Thus neglecting friction and the resistance of the antagonists, a force of less than 2 grams (between 1.1 and 1.83), applied as the muscles apply their force to the eye, suffices to rotate the eye with the observed velocity. Make liberal allowance for friction, for the drag of the optic and ciliary nerves, arteries, etc., and for stretching the relaxed antagonists; and we have say 5 grams as a rough estimate of the force required to rotate the eye.

The rotations of the eye with which we have to do are not large: 5 to 10° from the primary position will cover most of the movements. Here the resistance from friction and from drag by the optic nerve, etc., is at a minimum, and it would seem pretty plain that defects in these movements are not to be attributed to weakness or inadequacy of the muscles. But these constitute over 90 per cent of the movements made by the eyes; and it is certain that the discomfort and disability caused by heterophoria, in the general run of cases, result from using the eyes in this comparatively narrow field. Moreover, the sensations and symptoms are not those of muscle fatigue in their characteristic form.

If the defects in the ocular movements are not to be attributed to weakness or inadequacy of the muscles, to what are they due? Obviously to the nervous control or coordination of the muscles. The reason I cannot play the piano like Paderewski is not chiefly or largely because my muscles are not strong enough; it is because I cannot manage them right; it is the inability to coordinate, etc. So in a case of exophoria with deficient convergence, the reason the patient cannot converge properly is not because his internal recti are weak. If that were so, he could not rotate his right eye toward the nose in looking to the left, and his left eye toward the nose in looking to the right as he does perfectly. So also the reason we cannot diverge our eyes more than 6 or 8 prism diopters is not because the external recti are weak. Each eye can be rotated temporally as far as the outer canthus. If both could be so rotated at the same time, the divergence would be fully twenty times as much (80 or 90°). As Landolt put it about forty years ago,

"In short, notwithstanding the normal mobility of a single eye, the amplitude of convergence [or divergence] may be limited in consequence of disturbances [defects] of innervation, which alter the synergetic functions of both eyes, their cooperation in binocular vision."*

It becomes easy to understand how the ocular muscles move the eyes so efficiently in some directions and so poorly in others. For instance, take the internal and external recti. Abundant provision is made to innervate simultaneously the internal of one eye and the external of the other in making conjugate movements to the right

*Landolt: Refraction and Accommodation of the Eye, p. 195.

or left. These are very important movements, frequently made, and hence Nature has provided the mechanisms needed. So with the other conjugate movements—those of elevation and depression, which require innervation of a larger number of muscles, but for which abundant provision is made. When we consider the disjunctive movements, we find no such ample provision, even for convergence. Whereas the internal rectus of either eye can be innervated to rotate its eye 45 to 50° from the primary position toward the nose, provided the other eye makes a conjugate rotation with it; the two internal recti cannot be innervated simultaneously, as is necessary for convergence, for more than about half as many degrees, rarely 30°, usually about 24 to 27° (Duane, Fuchs).

For the disjunctive movement of divergence, no provision is made to innervate the two external recti simultaneously to produce more than about 1.5 to 2° of rotation from the primary position in each eye, equivalent to 6 to 8 prism diopters of divergence. Finally, in vertical disjunctive movements we are limited to rotations of 0.5° on the average for each eye (2 pr. diopters for the two eyes).

The vertical muscles are strong enough to rotate the right eye up 40°, and the left eye down 45°, at the least. If the eyes could rotate at the same time, one up and the other down to this maximum extent, they would make a vertical disjunctive movement of 85°, which is about fifty times the normal amount. It is impossible to explain the inability to diverge vertically as due to weakness of the muscles; it is clearly a matter of innervation.

Let us consider very briefly the clinical evidence in a couple of illustrative cases:

Case I.—Exophoria far 4 Pr.D.; near 12 Pr. D. Prism divergence 6 Pr.D. Near point of convergence 12.5 cm. = 8 meter angles (normal is 16 M.A.). These are typical findings in a case of exophoria with deficient convergence. Why has the patient exophoria? Is it because his internal recti are weak? Certainly not. If they were he could not rotate each eye in turn toward the nose 50°, as he can do without difficulty (conjugate rotation). The reason he has deficient convergence is because he cannot innervate the two internal recti at the same time to a sufficient extent (disjunctive rotation).

Suppose you operate on such a case by tenotomy of the external recti. At the end of a week you may have esophoria of 4 Pr.D. (intentional over-correction). At the end of the next week there will probably be 2 Pr.D. esophoria. In two months there will be exophoria again — nearly back where you were in the beginning—showing that the innervation which was at work in the first place is still at work, and has not been remedied by tenotomy. The wiser method of operating in such a case is by advancement of the internal recti, aiming at very liberal initial overcorrection, preferably on one eye at a time, using the result of the operation on one eye as a guide to the amount of shortening needed later on the other. This is not attacking the innervation, which is the seat of the trouble, for the very good reason that the innervation cannot be directly attacked by operation. All we can do by operation is to alter the position of the muscles in such a way that the same amount of innervation that was originally available will be able to accomplish more because working at a greater advantage.

Case II.—The patient is 25 years old. Esophoria far 4 Pr.D.; near, 5 Pr.D. Prism divergence, 6 Pr.D. Near point of convergence, 6 cm. (16 M.A.). Near point of accommodation, 8 D. Is this esophoria due to weakness of divergence? No, because the patient can diverge 6 Pr.D., which is not subnormal. That it is not due to excessive strength of the internal recti is best shown by the way it can be cured. The patient's near point of accommodation is 8 D. At the age of 25 he should have 10 D. of accommodation. This taken with the esophoria makes you strongly suspect hypermetropia.

O.D. + 2.00 sph. + 0.50 cyl. Axis 80°
O.S. + 1.75 sph. + 0.75 cyl. Axis 100°

Correct this refractive error, and his eye troubles disappear. We have cured his esophoria by relieving his accommodation. This is purely a matter of innervation and has nothing to do with the strength of his internal recti.

The way the eyes take care of a heterophoria, the way they are able, despite a tendency to deviate, to keep the two eyes properly fixed on the object of regard, is by virtue of their ability to make compensatory rotations of the eyes. These compensatory movements are always disjunctive, of course, because in conjugate movements both eyes rotate equally in the same direction. The movement of redress which rotates into proper position an eye which was deviating under the cover test is always a disjunctive movement. Normal eyes without heterophoria have very little need for these disjunctive movements. Hence, Nature has made little provision for them.

Study of the eye movements by photography has shown that the movements may be analyzed into two parts. When we look from one object to another, the eyes rotate rapidly until the line of sight

is approximately correct. This is the first and major part of the movement. It is followed without perceptible break by the second part, which consists in the final adjustment of the eyes so that the images fall on the foveae. This final adjustment may require some slight disjunctive movement.

But although these disjunctive adjustments are normally small, there is plenty of evidence that by prolonged and persistent exercise they can be greatly increased, like so many other compensatory mechanisms in the body. For example, if a slow-growing tumor pushes one eye out of place, there would very soon be diplopia if the eyes did not acquire the ability to overcome this tendency by a greatly increased power of compensation. Again, we often see in myopes who have long worn rather strong lenses an ability to overcome vertical prisms two or three times stronger than ordinary persons can. The explanation is found in the fact that they have been wearing glasses which were often a little out of level, and consequently decentered vertically, thus acting as vertical prisms. This has served to exercise their power of making compensatory disjunctive vertical movements of the eyes; and they have acquired far greater control over these movements than ordinary persons have. So I suppose that if we exercised patients with other defects, we could in many, or at least in some cases, improve their power of control. Personally, I cannot report any large number of cases in which that has been done. My attitude at present is not that of the enthusiastic advocate, but of the hopeful observer.

DISCUSSION

Dr. G. C. Savage, Nashville, Tenn.—I have listened to every word the Doctor has said and have enjoyed his address, although I do not believe he is right all along the line; and he knows that I do not. In the first place, what is heterophoria? It is an unbalanced condition of the ocular muscles. Why is there ever an unbalanced condition? It exists because of one of two things: either the one muscle of a pair is smaller and weaker than the other, or the one muscle, when the two are of the proper size, has a more favorable attachment than the other, or vice versa. When we are testing for exophoria or esophoria there is no activity of any brain center. The mechanical test for the phorias puts at rest every brain center that has any connection with the ocular muscles being tested; and what we find is not chargeable to muscle contraction, but to muscle tonicity. Tonicity is muscle state under a minimum nerve influence, and that minimum is practically zero. Contractility is the muscle acting under nerve influence that comes from some center of the brain. There are two kinds of brain centers for controlling the ocular muscles when working at the task of effecting binocular single vision. These are the conjugate, or verting, centers, and the fusion, or duction, centers. The former are in the cortex of the brain and are under the control of the will; the latter are at the base of the brain and are under the control of the fusion faculty of the mind. The conjugate centers act alike on two muscles, one connected with the one eye and the other connected with the other eye. When the conjugate center discharges its neuricity it is distributed to the two muscles under its control. If it comes from the fourth conjugate center, both eyes will move to the right; if from the fifth, both will go to the left; if from the third, the two eyes will converge; if from the second, the eyes go down; if from the first, they go up. The conjugate centers are double in action; the fusion centers are single in action; the conjugate center controls two muscles; the fusion center acts on only one muscle. When we are testing for heterophoria there is no activity of any fusion or of any conjugate center. Tonicity is the muscle state when under a minimum of nerve influence, and that means no influence at all, either conjugate or fusional. While the eye is under test we measure the esophoria, exophoria, cataphoria, hyperphoria, or cyclophoria; and by these measurements we learn only of muscle tonicity and not of muscle contractility. The latter is ascertained by the verting and duction tests. Normal muscle tonicity insures normal contractility.

Dr. Tom A. Williams, Washington, D. C.—I came to hear this paper and learn something. I want now to ask a question in reference to tonus. Of course we know the tonus is under the regulation of the nervous system. There are cases in which, such as in encephalitis, there may be inability of the patient to focus the eyes upon the finger. The patient seems to have the greatest difficulty in doing this and can only be made to do so by persuasion, just as he can only be made to perform movements of the limbs by persuasion. In those cases we notice a position of the ocular axes similar to that in hyperphoria. The question I want to ask is whether or not in those cases the situation is not simply one of inability of the patient to regulate the tonus of the oculo motor muscles?

I must say that as a neurologist Dr. Lancaster's thesis appeals to me much more than does that of Dr. Savage. It seems to me it is a neurological problem rather than one of the mechanical position of the muscles.

Dr. Lancaster (closing).—Of course my object in presenting this paper was not to express my personal views, but rather to emphasize certain points which seem to me to be commonly misun-

derstood and misrepresented. The statements I have made I believe to be all thoroughly established and accepted by the best authorities. Any one offering other views must furnish proof: mere assertion is quite insufficient.

Reference has been made by some of the speakers to the tonus of the ocular muscles. This tonus is exactly what you measure when you cover one eye, as in testing for heterophoria. The eye so covered is not seeing if we are using the cover test, or is not exercising normal binocular vision if we are using the rod test or the prism diplopia test; but it is by no means on that account in a completely relaxed state, free from innervation ("neuricity") as if in narcosis, or as if the nerves were cut which innervate the muscles of that eye. On the contrary, they are in a state of tonus, and that tonus is the algebraic sum of a multitude of stimuli, some inhibitory or negative, and some positive, reaching the ocular muscles by way of the nuclei of the motor nerves of those muscles, and reaching those nuclei from various sensory sources, chiefly the two retinas, and from the cerebral cortex. One factor of innervation is removed in making the tests for heterophoria, and one only. This is the stimulus which comes from binocular vision. Our tests are all so planned as to prevent binocular vision. That is the very essence of the tests. The stimulus which comes from that is removed. All others remain and are measured.

It is certainly a serious error to think you are measuring the eye without any "neuricity" (innervation). Dr. Savage said that there is a minimum of neuricity in his test, and that "minimum" means "nothing." On the contrary, it means a good deal! This error goes to the very foundations of the subject of heterophoria. It is possible to observe the position the eyes take when innervation or "neuricity" is in abeyance, namely, in deep narcosis, with ether or chloroform, for example. Under these conditions the eyes do not assume a position of orthophoria, nor is the position they assume any guide to the presence, kind or degree of heterophoria.

The very essence of heterophoria is the defect or abnormality of innervation. It is possible to have anatomical abnormalities which tend to throw the eyes out of alignment; but it is possible and common for these to be cared for by compensating innervation. When the innervation fails to compensate and to hold the eyes in suitable position, we get the disturbances of heterophoria. Hence, in making tests for heterophoria, always place the eyes in a condition of normal innervation. This means that if glasses are to be given for error of refraction, these should be worn when the tests are made, and also the patient should not be in any degree under cycloplegia.

The case Dr. Williams cites differs from the cases of heterophoria which we have been discussing in that there is present a paresis, an actual damage to the nerve centers, the motor nuclei, beneath the aqueduct between the third and fourth ventricles. That introduces too large a subject for discussion now, though closely allied to our theme. As Dr. Williams puts it, the patient is unable to regulate the tonus of the ocular muscles. This is quite correct and the reason he cannot regulate the tonus is because of the paresis caused by the encephalitis. Whereas in heterophoria, though here, too, the patient cannot regulate the tonus of his ocular muscles, it is not because of paresis, still less is it due to one muscle of a pair being smaller or having a less favorable attachment, it is due to a fundamental lack of coordination on the part of the vein centers, not an acquired paresis. The nerve cells are there and are not paralyzed nor weak. Simply they have not the capacity to act in suitable grouping and number to produce the proper coordination any more than the motor cells which control my fingers can make them play the violin. They might do something at it by practice and exercise and so might the ocular motor nerve cells.

DERMOID OF THE CONJUNCTIVA: REPORT OF A CASE*

By Clifton M. Miller, M.D., F.A.C.S.,
Richmond, Va.

Dermoid of the conjunctiva has long been recognized as a clinical entity and its history and causation have been the subject of some controversy. Ryba made a detailed study of their anatomical structure and first gave the name to these growths.

The question of the classification of benign tumor in the transition fold presenting the clinical aspects of lipoma has been much disputed. Hoch, Rogmann and Lagrange maintained that pure lipomata occur at this site, while Bogel, Ricke and Nobbe claimed that the tumors were of teratoid character. Nobbe made histological studies of the tumors and demonstrated cuticular elements which were so slight that it is possible that they had been overlooked by other observers. He classified lipodermoids topographically as follows: lipodermoid of the corneo-scleral boundary, lipodermoid of the transition fold, and lipodermoid of the caruncle.

Gallenga had made three groups of these tumors, viz. (1) pure dermoids, (2) lipodermoids, and (3) mixed forms (lipomata containing acinous, acino-tubular glands or cartilage).

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*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Fuchs says: "They are, so to speak, islands of skin upon the surface of the eyeball," and that they are always congenital and frequently associated with other congenital anomalies, such as harelip, etc. Roemer confessed our inability to decide which is correct: the theory of Ramak, who believes that it is a fetal invagination of the external blastoderm, or that of van Duyse, who holds it to be caused by an adhesion of the amnion to the surface of the eyeball in a very early period of fetal life.

Ryba's theory of the origin of dermoids of the conjunctiva is that they are due to failure of complete closure of the eyelids with a cornification of the conjunctiva and cornea occurring at the position of the lid notch. This theory is supported by Collins. W. B. Weidler, quoting Ryba's theory, says in opposition to it, "This would lead us to expect dermoid growths whenever there is a coloboma of the lids, which is not true, however, as there have been a number of such cases where there were no dermoids." Weidler also quotes Fuchs as saying in opposition to the theory of van Duyse that "it does not explain why this point of attachment shows the structure of the external skin with glands, since the amniotic bands are simple connective tissue."

Gallenga (quoted by Cosmettatos) holds that a dermoid consists of the tissue of the plica semilunaris drawn over the cornea, its middle portion later on becoming atrophied, whilst its tip becomes agglutinated at the selero-corneal limbus remaining adherent and giving rise to a dermoid. Cosmettatos, to give a better understanding of the formation of a dermoid, explains the histology and development of the caruncula lachrymalis. The latter is a prolongation of the lids situated at the inner canthus appearing as a rounded elevation and extending to the lower fold by a lengthy pedicle. Its histologic structure shows the same elements as the lids, composed of a mass of dense connective tissue, covered by several layers of flattened epithelium. Between the connective tissue fibers we find smooth as well as transverse muscle fibers of varying size, some clinging to the hair follicles, others independent of it. Here we have all the cuticular elements growing within the conjunctival sac, giving opportunity for aberrations or new locations of these elements in more distant parts of the conjunctiva by prenatal implantation.

Levings defines dermoids as innocent, slow-growing cystic tumors which take their origin from embryonal inclusions of either the epi- or hypo-blast. Coming from the epiblast they have the characteristic structure of the skin, but are found where this tissue does not normally exist. If due to inclusions of portions of the hypoblast, the cyst wall will correspond in structure to a mucous membrane. The teeth which occur in dermoids are the product of a stratified epithelium and a subcutaneous connective tissue, while those found in the mouth are the products of a stratified epithelium and submucous connective tissue. He defines a teratoma as a tumor coming from two, possibly three, of the germ layers and always including mesoblastic tissue.

Accepting the above definitions as correct, the histological reports of tumors found in the orbit would indicate that both the dermoid and teratoid type had been found.

The weight of authority seems to be upon the side of the theory of Ramak, and this theory appears to be still further strengthened by the undoubted frequency of occurrence of deformities coincident with dermoids, which deformities point to aberrations of development of the blastoderm.

Picque collected 97 cases of dermoids of the conjunctiva, in 27 of which there were other congenital defects, such as coloboma of the lids, iris, choroid, etc.

Cosmettatos, in an exhaustive review of the literature, quotes authority for the finding in the dermoids of sweat glands, hyalin and articular cartilage, bone and muscle fibres. Dermoids in practically all cases are congenital, but M. S. Mayou reports two cases of implantation dermoid of the conjunctiva occurring in his own practice and quotes two other cases reported by Uhthoff and Collins. He says this form may occur in two ways: (1) by the downgrowth of the surface epithelium of the conjunctiva following a wound of that membrane, the connection with the

surface epithelium becoming subsequently cut off by atrophy, due to pressure of the newly-formed fibrous tissue; and (2) by direct carrying in of the conjunctival epithelium by a foreign body. This latter method of formation was first shown in one of his own cases by careful histologic examination of serial sections.

The majority of the cases reported are of the sclero-corneal type. The favorite site of these seems to be the inferior temporal segment of the eye. The usual site for dermoids of the transition fold is between the superior and external recti muscles. The tumors are as a rule single, but Wagenmann has reported a case where two occurred in the same eye, one corneoscleral and the other in the transition fold.

The treatment is strictly surgical and care should be used that there is complete removal for any small part left may be the cause of a new tumor forming.

CASE REPORT

A. B., a female, age 9 years, was seen September 1, 1904.

No deformities or dermoids had occurred in other members of the family. The father and mother were living and in good health.

The patient was born July 5, 1895. She was a healthy normal baby and with no deformities of any kind.

A few weeks after birth, the parents stated, they noticed a growth of some kind under the left eyelid. A short time later a hair or two projected under the lid and these continued to grow in length and increase in number until there were six or seven long black hairs growing from under the lid. These hairs grew rapidly and were frequently cut to prevent their hanging too far down on the face, but they were always left sufficiently long for the cut ends to project beyond the lids.

Examination showed a healthy, well-developed girl with no deformity except about the left eye. The left upper lid continuously drooped and seven or eight coarse black hairs projected from beneath it. A tumor was felt on the temporal side. On having the patient look down, with a very slight elevation of the lid, an ovoid, pinkish mass, elastic to the touch, was seen beneath the temporal portion of the upper lid, from the most prominent portion of which the hairs were springing. The covering epithelium was firmly adherent to the underlying portion of the tumor. Pressure was painless. The eye was pushed somewhat downward and inward by the mass. Under a general anesthetic the tumor was removed without difficulty. No bands of adhesions to the frontal bone could be demonstrated.

The tumor measured 26x18x8 mm. The central cavity contained a yellowish fluid. A small bony mass the shape and size of the crown of a canine deciduous tooth was found in the tumor.

Diagnosis: lipodermoid of the transition fold containing hairs and a deciduous tooth.

This case has been examined in the past few weeks. There is no appearance of any return of the growth. The eye is normal in movement and appearance, and there is no sign of any physical weakness except a condition somewhat resembling angioma of a vocal cord.

The majority of cases reported seem to differ from mine in that they are of the corneo-conjunctival type containing in the main cuticular elements only, and hence it seems should be classified as moles, which may be called dermoids because of their structural resemblance to the skin and are so classified by J. Bland Sutton, yet are not teratomata. While many of the reports speak of the presence or absence of developmental defects, none of them mentions whether the person affected had cutaneous moles in other areas of the body. Statements regarding this would be interesting as tending to show whether the person had a tendency to show the formation of moles one of which was located on the conjunctiva.

The case here reported seems to be a true teratoma, occurring as it did in one of the developmental clefts, the orbito-nasal, in all respects seeming to resemble the dermoids of the ovary, which are not infrequent. A congenital tumor of this character should not, it appears to me, come under the same classification as the so-called conjunctival dermoids which appear more of the character of pure skin growths and not implantation tumors found at a point of closure of a fetal developmental cleft.

A study of the histology of all the cases of true dermoid of the eye so far reported, except of course the implantation dermoid, shows that they in no way differ from dermoids of other portions of the body. It is generally conceded that dermoid results from the inclusion within the mesoblast of a nest of embryonal cells, or a portion of the skin or mucous membrane, as a result of disturbance of embryonic development. This inclusion always occurs along one of the natural embryonic fissures.

A careful consideration of the above statements taken as they bear upon each other causes one to wonder why so much labor has been expended to bring forward

theories as to the cause of dermoid of the eye. Is the structure and development of the eye so different from all the other structures of the body that a special explanation must be offered for the occurrence of an extraneous growth here, which does not differ histologically from the same type of growth found in other portions of the body? This seems too labored and there is apparently no good reason for any special theory of the occurrence of dermoid in this particular locality.

In embryonic life the optic visicle buds forward from the forebrain into the orbitonasal fissure, or the highest fissure connected with the large cavity, representing the embryonic mouth.

"The hypoblast overlying the optic vesicle becomes thickened, invaginated and finally cut off as a hollow island of cells which is developed into the lens and is named the lens vesicle. This lens rudiment indents the other and lower part of the optic vesicle.

"The condensed mesoblast surrounding the optic cup becomes the sclera and choroid. In the portion of the mesoblast which lies in front of the lens a cleft-like fissure appears and divides it into a thick anterior and a thin posterior layer. The former becomes the substantia propria of the cornea, the latter, the stroma of the iris and anterior part of the vascular tunic of the lens. The fissure represents the future anterior chamber and its lining cells form the layer of endothelium on the back of the cornea and front of the iris." (Cunningham)

Do the above facts in the embryology of the eye give reason for the formation of a theory of dermoid formation in this region different from its method of formation elsewhere in the body? Such does not seem to the writer to be the case. On the contrary, he is of the opinion that a careful study of all the facts bearing upon the embryology of the eye and the histology of the tumors in question distinctly includes their method of formation in the definition above given. A dermoid results from the inclusion within the mesoblast of a nest of embryonal cells, or a portion of the skin or mucous membrane, as a result of disturbance of embryonic development.

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Stuart Circle Hospital.

DISCUSSION

Dr. Adolph O. Pfingst, Louisville, Ky.—Like the essayist, I believe that quite a distinction should be made between dermoid growths at the corneal margin and the ones occurring at other portions of the conjunctiva. In regard to the marginal growths, the theory advanced by Ryba seems rational, i. e., during fetal growth an implantation of skin takes place between the cleft of the eyelids on the eyeball, which subsequently develops and forms these skin growths. They are congenital and grow only in size in proportion as the rest of the body grows until the age of puberty. It is usual that they begin to enlarge at that time. I do not know whether I have been unusually fortunate or whether dermoids of the eye are more common than we think, but I have seen six or seven of these growths, all of them about the same size, ¼ inch in diameter.

Microscopic examination shows that while they are like skin in many ways, they have not the well developed papilla found in true skin. The papillae are rudimentary. While I have examined microscopically all of the growths which I removed, I have never seen sweat glands in them. In fact, I believe that they are always lacking in these. They have sebaceous glands, hair and hair follicles. As these tumors nearly always straddle the corneo-scleral margin, a superficial opacity of the cornea remains after their removal.

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EDITORIAL DEPARTMENT

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TRANSFORMATION OF THE INTESTINAL FLORA

The bacterial flora of the intestinal canal contains many different types and kinds, some of which when grown in a test tube can be demonstrated to produce toxic substances. According to the theory of intestinal auto-intoxication, these toxins may be absorbed and produce a great variety of conditions and diseases, including aging of tissues, or premature senescence. Efforts to overcome the putrefaction produced in the intestinal canal by some of these bacteria have been made from time to time. The use of intestinal antiseptics had its sway, but has largely been abandoned for other more popular methods.

The method of simplifying the intestinal flora advocated and popularized by Metchnikoff[1] and his followers became popular about 1907. The idea was to supplant the conglomerate bacterial flora, including the supposedly harmful bacteria, by a harmless one. *Bacillus bulgaricus* was selected for this purpose because of the fact that it had been found to be the predominating milk souring organism in Bulgaria, where the people subsist chiefly on milk and milk products and where vigor and longevity are proverbial. Administration of preparations of *B. bulgaricus* for therapeutic purposes grew to enormous proportions, despite the fact that repeated observations have shown that this organism cannot grow and be colonized in the intestinal canal. The only therapeutic value claimed or expected from the administration of *B. bulgaricus* is that it should multiply in the intestinal canal and thereby replace or crowd out other harmful bacteria. As long ago as 1908 Herter and Kendall[2] demonstrated that the organism does not survive below the ileo-cecal valve. More recently Rettger and Cheplin[3] have more thoroughly investigated the viability of *B. bulgaricus* and have demonstrated definitely that it cannot survive in the intestinal canal either of experimental animals or of man.

The worthlessness of *B. bulgaricus* for therapeutic purposes is pointed out by Bass in an article on this subject in the present issue of the JOURNAL (page 1). He calls attention, however, to the fact that the failure of *B. bulgaricus* to live and grow in the intestinal canal and thereby to accomplish the object for which it has been employed does not disprove in any way the theory of intestinal auto-intoxication or the theory that it may be overcome by replacing the harmful with harmless bacteria.

In the more recent efforts to accomplish the desired transformation of the intestinal flora, *Bacillus acidophilus*, a normal

1. Metchnikoff, E.: 1907. The Prolongation of Life. New York. 161-183.

2. Herter, C. A., and Kendall, A. I.: 1908. Fate of B. bulgaricus (in bacillac) in the Digestive Tract of a Monkey. Jour. Biol. Chem., vii, 203-236.

3. Rettger, L. F., and Cheplin, H. A. 1921. Intestinal Flora. Yale University Press.

inhabitant of the intestinal canal, especially during early childhood, has been employed. *B. acidophilus* is the predominating organism in the bacterial flora in healthy babies following the cessation of exclusive breast feeding. In fact, it is present in large proportions in health during the exclusive breast feeding period. Increase in the number of *B. acidophilus* present in the intestinal flora and corresponding reduction in the number of other bacteria present may be brought about by one or both of two ways. Dietary changes to include relatively large amounts of lactose or dextrin result in rapid increase in the proportion of *B. acidophilus*. Cannon[4] was able to transform the flora of experimental animals (rats) from almost no acidophilus to almost exclusive acidophilus simply by changing the diet from one containing a large amount of meat to one containing a large amount of lactose. Lactose in sufficient quantities (250 to 300 grams per day) changes the flora in man to one predominated by *B. acidophilus* within a few days. This amount of lactose is too large, however, to be continued over any considerable length of time.

It has been demonstrated by Rettger and Cheplin[3] and later confirmed by Bass that ingestion of large quantities of milk cultures of *B. acidophilus* leads to rapid transformation of the intestinal flora. This condition of predominance of the supposedly harmless *B. acidophilus* largely to the exclusion of other types, including the proteolytic bacteria, can be maintained under experimental conditions, at least, over considerable periods of time by feeding cultures of *B. acidophilus* grown in milk in connection with the ordinary diet. Since the milk culture of *B. acidophilus,* or acidophilus milk, as it is called, is an agreeable and palatable food beverage, this method of changing and maintaining the desired intestinal flora may be found to be practical for therapeutic purposes. At any rate, it would seem that since it is now possible to establish and maintain experimentally the condition aimed at in former attempts to replace the putrefactive with non-putrefactive bacteria, it should now be possible to ascertain whether diseases and conditions supposed to be due to intestinal putrefaction are in fact caused in this way. If so, a promising remedy will be at hand.

4. Cannon, Paul R.: 1921. The Effects of Diet on Intestinal Flora. Jour. Inf. Dis., xxix, 369.

TUBERCULOSIS IN CHILDHOOD

According to the most careful investigation, the child is free from tuberculosis at birth even though one or both parents may be tuberculous. Infection is not so likely to take place before three years of age because there is less exposure at that time. However, if there is open tuberculosis in the same house, infection is sure to follow. Infection in the child under three years of age is very apt to result in disease of the acute, rapidly fatal type.

The percentage of infection after three years of age gradually increases until it approaches one hundred per cent at about eighteen years of age. While infection after three years of age rapidly increases, and while demonstrable disease may often develop, it is of the chronic type which seldom leads to a fatal termination. Tuberculosis in the adult is practically always the result of childhood infection which has become active because of lowered resistance.

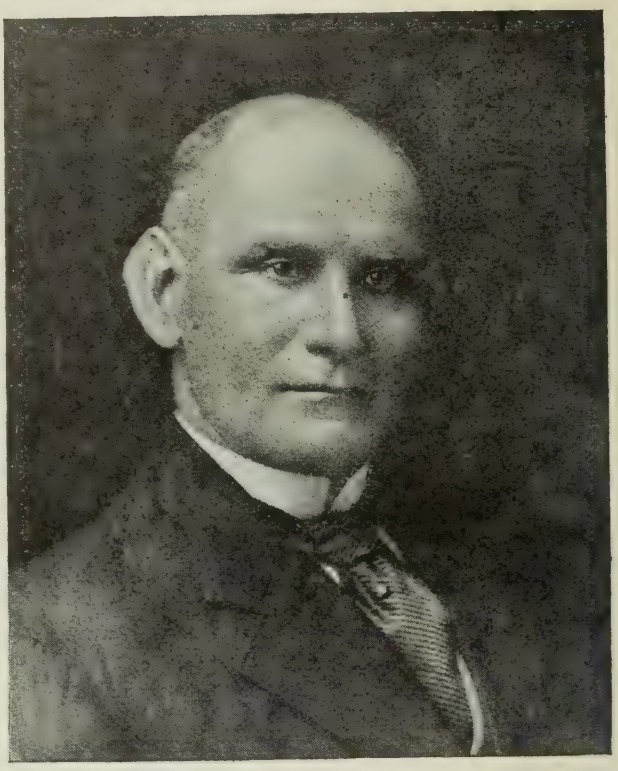
The recent rapid decline in the death rate from tuberculosis in this country has been largely attributed to improved environment (especially for the poorer classes), better financial and living conditions, and decreased occupational hazards.

While the child has participated in the benefits derived from the general improvement in environment, it would seem wise, in view of the facts stated above, to devote special attention to environment in infancy and childhood. In the first three years of life the child should be particularly guarded against contact with tuberculosis because of the grave danger of immediate development of rapidly fatal disease, and because children exposed at that early age are, in all probability, more apt to develop active disease in later life.

It is not sufficient to say that the tuberculous mother should not nurse her child. The danger is through contact, and not merely through the act of nursing. While infection after three years of age is practically inevitable through the usual contact with the world, the child should be guarded against massive infection which usually arises through continued contact with open tuberculosis. In other words, infection should be so acquired that it becomes a protective process rather than a smoldering fire which may break forth with the least provocation.

Having applied the knowledge we have with reference to the control of infection, we should constantly strive to improve the environment under which children live. The saving power of rest, fresh air and good food should be universally taught. The public conscience should be so enlightened that it will demand for every child the chance to grow to maturity with a sound body. Under such improved conditions resistance to disease would be materially increased, the number of cases of active disease in childhood would be greatly reduced, and there would be fewer recruits for the great army of adult tuberculosis.

IN MEMORIAM



DR. FRANK A. JONES
Fifth President of the Association

Those who attended the recent meeting of the Southern Medical Association and had the privilege of seeing and talking to Dr. Frank A. Jones will be shocked and distressed to learn that his death occurred quite suddenly a few days after leaving Chattanooga. At that meeting he seemed in his happiest mood. At the annual dinner of the ex-Presidents of the Association, and on other occasions, he made talks filled with wit and wisdom that delighted his hearers. No doubt Dr. Jones realized that his death might occur at any moment; yet he enjoyed the fullness of life as if he were unconscious of the strain that his blood vessels were carrying on account of the high blood pressure with which he had been afflicted for a number of years. Death occurred from apoplexy.

Few physicians of this day in the South have made their impress in medicine more than Dr. Frank Jones. Born in 1869 in Brownsville, Miss., the son of a physician, and educated at the Louisville Medical College, he later established himself in Memphis. As Professor of Diseases of the Chest in the Memphis Hospital Medical College and later in the Medical Department of the University of Tennessee, for many years he taught physical diagnosis to thousands of young men, some of whom have become leaders in the profession. As a teacher of medicine Dr. Jones enjoyed the respect and even affection of his students, who still delight in repeating the forceful epigrams in which his lectures abounded.

As a physician and a diagnostician Dr. Jones had few equals in the medical profession and his studies in cardiac diseases have placed him high among the cardiologists in the United States. His opinions did not always coincide with other authorities and he had the courage to state his convictions in unequivocal terms even in the presence of the greatest cardiologists.

Dr. Jones made many contributions of value to the science and literature of medicine. He was among the first to advocate a liberal diet in typhoid fever; he described syphilitic aortitis; and he contributed many other papers on various medical subjects.

Dr. Jones was a man of unusual literary attainments. Judging from the frequent quotations which he made from Shakespeare and the Bible, he seemed to have memorized most of the literary gems found in those two books. Dr. Jones had a passion for Southern literature and was at his best when discussing the writings of Prentiss, Sidney Lanier and other Southern poets. He also made a thorough study of the history of the South. He loved the South and its traditions with passionate ardor; and he often protested against the injustice done the statesmen and military leaders of the South by authors who resided in other sections of the country.

Dr. Jones' devotion to the Southern Medical Association from its inception had much to do with its success, particularly in the early years. In a year or two, by his personal efforts, he secured more than a hundred members for the Southern Medical Association, and no one felt more pride in the growth and prestige which the Association has attained than Dr. Jones. That his efforts in the upbuilding of the Association were appreciated is evidenced by the fact that he was made its fifth President. He was never known to miss a meeting and was always a prominent figure in its deliberations. No member will be missed more than he. Thousands of physicians sincerely sympathize with his devoted wife in her great grief.

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(Meeting conjointly with Southern Medical Association)

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Southern Association of Anesthetists
(Meeting conjointly with Southern Medical Association)

Dr. Ansel M. Caine, President, New Orleans, La.
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Dr. W. Hamilton Long, Sec'y, Louisville, Ky.

Women Physicians of the Southern Medical Association

Dr. Elizabeth Kane, President, Memphis, Tenn.
Dr. Florence Brandeis, 1st V.-Pres., Louisville, Ky.
Dr. Iva Youmans, 2nd V.-Pres., Miami, Fla.
Dr. Josephine Hunt, Sec.-Treas., Lexington, Ky.

Book Reviews

Pulmonary Tuberculosis. By Maurice Fishberg, M.D., Clinical Professor of Medicine, University and Bellevue Hospital Medical College; Chief of Tuberculosis Service, Montefiore Hospital for Chronic Diseases, and of Bedford Hill Sanatorium for Incipient Tuberculosis. Third Edition, Revised and Enlarged. 129 engravings and 28 plates. 891 pages. Philadelphia and New York: Lea & Febiger, 1922.

This book, like the former editions, the author states, is intended for the general practitioner, a purpose which it fulfills very admirably. The author is over zealous in many of his positive italicized statements, especially in the chapter on "Differential Diagnosis." For example, on page 540 this statement is made: "A lesion at the base while the apex is free should be considered non-tuberculous unless the sputum is positive as regards tubercle bacilli."

Again, on page 546, first paragraph, this occurs: "When the apex shows no sign of a lesion, only positive sputum should justify the diagnosis of phthisis." Of course these statements hold true as a general thing, but it is not a hard and fast rule.

Dr. Fishberg has added two chapter to this new edition, one on "Reciprocal Relation Between Pulmonary Tuberculosis and Certain Physiological and Pathological Processes," and another on "Medical-legal and Insurance Aspects of Tuberculosis." Dr. Fishberg has covered these subjects with thoroughness. In general the whole work will be found helpful to the general practitioner.

Aids to Tropical Hygiene. By Colonel R. J. Blackman, C.B., C.M.G., C.I.E., D.S.C., M.D., F.R.P.S., M.R.P.E., D.P.H. (Lond.), Chevalier of the Legion of Honor; Croix de Guerre avec Deux Palmes et Etoile; Knight of Grace, and Medallist Order of St. John; Member of the Order of Mercy; Kaiser-I Hind Medallist for Public Service in India; of the Middle Temple and Gray's Inn, Barrister-at-Law; Late Deputy Director of Medical Services, Ninth Army Corps, B.E.F. in France. With a preface by Lt. General Sir John Goodwin, K.C.B., C.M.G., D.S.O., K.H.S., F.R.C.S., Director-General, Army Medical Services. Second Edition, Enlarged, Thoroughly Revised and Mostly Rewritten. 240 pages. New York: William Wood & Co., 1922. Cloth, $1.75.

As stated at the outset, the book was written with a two-fold aim, namely, "To provide the student for his D.T.M.H. and the major going up for promotion test with a ready means of revising his reading before examination, and to furnish the junior practitioner with a pocket edition containing a summary of the main facts with which the health officer in the tropics must be acquainted."

Certain diseases such as yellow fever and uncinariasis are not even considered, which is to be regretted. But the author wrote especially for the members of the Indian Medical Service, and the methods advised are described in detail. Hence when one recalls the field which Colonel Blackham has to cover, the book is remarkable in its presentation of the subject.

High Frequency Practice. For Practitioners and Students. By Burton Baker Grover, M.D., Author of "Handbook of Electrotherapy;" President of the Western Electrotherapeutic Association, 1919-1920. Containing 398 pages, illustrated with 95 engravings. Kansas City: The Electron Press, 1922.

The first thing that one notes on picking up this book is that there is neither bibliography nor are there references. A work which pretends to deal adequately with this subject cannot afford to omit accurate listing of the sources from which it obtains its facts. The sentence structure is careless throughout. The following example occurs: "The methods of treatment given in this volume, while in the main are founded on personal experience of the writer, reference has been made to all available literature upon the subject."

It deals briefly with the nature of electricity and methods of obtaining high frequency currents and their uses. Among the conditions listed as being frequently helped by the high frequency current are acne, albuminuria, anemia, amenorrhea, aneurysm, epilepsy, hemorrhoids, many diseases of the eye, and various diseases that have not been generally considered amenable to it. The book is a good synopsis of high frequency therapy.

Modern Methods in the Diagnosis and Treatment of Renal Disease. By Hugh MacLean, M.D., D.Sc., Professor of Medicine, University of London, and Director of the Medical Clinic, St. Thomas's Hospital; Honorary Consulting Physician to the Ministry of Pensions; Consulting Chemical Pathologist to St. Thomas's Hospital. With 102 pages. Philadelphia and New York: Lea & Febiger, 1922.

This is a short account of some of the newer methods used in the study of renal function. As it is intended for the general practitioner, it contains only brief allusions to theoretical points. There are chapters upon the significance of albuminuria and casts, blood examination dealing chiefly with blood urea, and other tests for investigating renal function such as the urea concentration test, the diastatic test, the dye tests and others. Some tests considered valuable are omitted. The latter half of the book deals with the value of renal examination and suggestions for dietetic treatment.

The book is less important than some American works upon the same subject. The English bias is, however, of interest and value.

The Treatment of Fractures. With Notes Upon a Few Common Dislocations. By Charles Locke Scudder, M.D., Consulting Surgeon, Massachusetts General Hospital; Formerly Assistant Professor of Surgery, Harvard Medical School; Fellow, American Surgical Association; Member, American Society of Clinical Surgery. Ninth Edition, revised, with 1252 illustrations and 748 pages. Philadelphia and London: W. B. Saunders Co., 1922. Polished buckram, $8.50.

The World War has intervened in the six years between the eighth and this ninth editions of Dr. Scudder's classic upon the treatment of fractures, and the War is acknowledged to have taught lessons in this field which are equaled in no other.

Emphasis in the last edition is laid upon the attempt to restore function to the skin, muscles, blood vessels, nerves, and to bones and joints in the neighborhood of the fracture. The Carrel-Dakin treatment of infected wounds is considered the most striking single contribution to modern treatment. The Thomas splint is extolled, and many other points of treatment are dealt with. The edition is thoroughly up-to-date and continues to be an authoritative treatise on fractures.

Rickets. A Study of Economic Conditions and Their Effects on the Health of the Nation. In Two Parts Combined in One Volume. Freely Illustrated. By J. Lawson Dick, M.D., Ed., F.R.C.S. Eng., Deputy Commissioner of Medical Services, London Regional Ministry of Pensions; Author of "Defective Housing and the Growth of Children," etc., containing 488 pages. New York: E. B. Treat & Co., 1922. Cloth, $5.50.

The first half of the book is largely a geographical survey of the incidence of rickets. It is absent, we are told, in Africa, India and the Far East generally, including Asia. It is rare in China and Japan. The author comes to the conclusion that rickets is not a dietary disease, but primarily a disease of slums, due to bad housing, though it is not confined to the slums. He calls it, "A disease of * * * overcrowding in great industrial centers and of cold climates and grey skies," since it is not found, he says, in the tropics and subtropics.

The latter part of the book is concerned with the etiology and treatment of rickets. The conclusions are interesting on account of the data given, though they are not generally accepted.

Animal Parasites and Human Disease. By Asa C. Chandler, M.S., Ph.D., Instructor in Biology, Rice Institute, Houston, Tex. With 254 Text Figures and 642 pages. Second Edition. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Ltd., 1922. Cloth, $4.50.

The author states in his preface that the object of the book is to present to the general public a knowledge relative to this subject.

The book covers the field of animal parasites in great detail. The sections on classification and description of the animal parasites as a whole are good. He also takes up descriptions of the host's which transmit the animal parasites.

It is to be regretted that under most of the parasites Chandler has included a section on treatment of the disease they cause, for not infrequently he states the teaching of one authority as final whereas others of equal, or even greater, experience do not accept those views.

In a section entitled "Sources of Information" he very helpfully lists books and periodicals devoted to parasitology or including a section on that subject.

Selected Works of Thomas Sydenham, M.D. With a Short Biography and Explanatory Notes. By John D. Comrie, M.A., B.Sc., M.D., F.R.C.P., Edin., Lecturer on History of Medicine and on Clinical Medicine in the University of Edinburgh; Lecturer on Practice of Medicine in the School of Medicine of the Royal Colleges at Edinburgh; Late Consulting Physician to the Forces in North Russia. With 151 pages. New York: William Wood & Co., 1922.

Thomas Sydenham (1624-1689), a Puritan physician, famed for his clinical studies of disease, has come to be known as "the Hippocrates of English medicine." The first to describe scarlet fever and Sydenham's chorea as entities, a popularizer of Peruvian bark for agues, a contributor to the subject of gout (from which he himself suffered), Sydenham was the greatest clinician of his day. Incidentally the Thomas Dover whom Osler so charmingly describes as "Physician and Buccaneer," the originator of compound ipecacuanba powder, was one of Sydenham's pupils.

The little volume under discussion, after a brief account of Thomas Sydenham's life, gives well chosen selections from his principal works which have so enriched medicine by their accurate observations, opposition to the mystic and revolting prescriptions and practices so popular in his day, and by their faith in the value of Nature as an ally.

Of course, Sydenham wrote altogether in Latin, of which the excerpts are translations. Despite the small type employed, the choice of selections is good, and the little work is a welcomed addition to historical and biographical medicine.

Diseases of Women. By Harry Sturgeon Crossen, M.D., F.A.C.S., Clinical Professor of Gynecology, Washington University Medical School; Gynecologist-in-Chief, Barnes Hospital and the Washington University Dispensary; Gynecologist, St. Luke's Hospital; Consulting Gynecologist, Jewish Hospital, St. John's Hospital and the St. Louis Maternity Hospital; and Fellow, American Gynecological Society and American Association of Obstetricians, Gynecologists and Abdominal Surgeons. Fifth Edition, revised and enlarged, containing 1004 pages and 934 engravings, including one color plate. St. Louis: C. V. Mosby Co., 1922. Cloth, $10.00.

The illustrations, some of which are reproduced from other authors, are particularly good. Those of gynecologic microscopic anatomy and pathology are photomicrographs rather than drawings. Dr. Crossen states that "The various elements of these complex structures * * * change considerably in estimated relative importance with additional study and changing theories. A tissue element considered merely incidental today becomes of decided functional value tomorrow. Hence the importance of presenting at all times as complete a tissue picture as possible, even at the expense of some clearness in detail."

He goes at the subject empirically, gynecology being still more or less of an empirical science. The book opens with a description of how to obtain the patient's history and symptoms, then how to conduct an examination. He continues rather in the manner of one conducting a clinic, which is probably after all the best way of teaching any medical subject.

This edition, just as did its four predecessors, maintains a first rank among single volume works on gynecology.

Syphilis. By Burton Peter Thom, M.D., Visiting Syphilologist, Hospitals of Department of Correction, Welfare Island, New York City. Illustrated with 69 engravings. 525 pages. Philadelphia and New York: Lea & Febiger, 1922. Cloth, $5.50.

A masterpiece in a single volume text book on syphilis would not be putting it too strongly. The author's knowledge of the subject is so great that he needs simply employ a part of it to write the best work on syphilis that has come into the reviewer's hands. He proves by the ease with which he presents facts and discusses his subject that his reserve power is immense.

In addition to being a scientific work the book is not without some literary value.

Gonorrhea and Impotency. Modern Treatment. By Edwin W. Hirsch, S.B., M.D., 1st Lieut., M.C., U. S. Army. With an additional lecture on ultra-violet radiation. By A. J. Pacini, M.D. Illustrated. 172 pages. Chicago: The Solar Press, 1922.

This is a work of the second magnitude on a minor surgical subject.

The illustrations are poor, the text is bad and the book contains many technical errors.

Mixed with a few scientific facts is a great deal of fiction concerning therapeutic procedures which are generally considered of no value.

Diseases of the Skin. By Henry H. Hazen, A.B., M.D., Professor of Dermatology, Medical Department, Georgetown University; Professor of Dermatology, Medical Department, Howard University; Sometime Assistant in Dermatology, Johns Hopkins University. 2nd Edition. 241 illustrations, including two color plates. St. Louis: C. V. Mosby Co., 1922. Cloth, $7.50.

It may be said at the outset that the reviewer does not believe this book does credit to its author so much as do his excellent monographs on "Skin Cancer" and "Syphilis." It seems loosely written and does not rise above the numerous works on skin disease intended for the student and general practitioner.

Following the descriptions of each disease the paragraphs on treatment are brief to the point of poverty, and will prove exasperating to the busy man, who, failing to find the details of treatment under their proper headings, will rarely have the patience to dig them out of the separate chapter devoted to generalizations on treatment.

Disorders of the skin in the negro are featured both in the text and in the illustrations, and since for this reason the volume makes its principal appeal to Southern physicians, it is regrettable that dysidrotic ringworms, so prevalent in this section, should have been passed over with only nine lines.

The discussion of the relative values of x-ray, radium and ultra-violet light is trustworthy and good. Furthermore, no other work on skin diseases gives Remer and MacKee's method of x-ray dosage in such satisfying detail.

Tuberculosis and the Community. By John B. Hawes, 2d, M.D., Director, Clinic for Pulmonary Diseases, and Assistant Visiting Physician, Massachusetts General Hospital, etc. 168 pages. Philadelphia and New York: Lea & Febiger, 1922. Cloth, $1.75.

Dr. Hawes takes up in a masterly manner the sociological side of the subject, calling attention to the fact that the care of the tuberculous patient after leaving the sanatorium is of as great, or greater, importance than the problem of handling the tuberculous patient in the sanatorium, and that the state's duty to the patient in no wise ceases when the latter leaves the sanatorium.

The chapter on "Tuberculosis with Relation to Schools and School Children" calls attention to one of the most promising efforts at a reduction in the tuberculous mortality. It is to be regretted that Dr. Hawes does not go more deeply into that phase of the work which is now being done along that line.

This book should appeal to any one interested in the problem of tuberculosis and especially to those in the districts where the tuberculosis problem is handled only in a most desultory manner.

Clinical Medicine, Tuesday's Clinics at the Johns Hopkins Hospital. By Lewellys F. Barker, M.D., LL.D., Professor of Medicine, Emeritus, Johns Hopkins University; Visiting Physician to Johns Hopkins Hospital, Baltimore, Md. Octavo of 617 pages, illustrated. Philadelphia: W. B. Saunders Co. Cloth, $7.00 net.

The value of reports of important clinics has been definitely realized and the profession welcomes this one from Dr. Barker's Clinic. Recognized as one of the great leaders and foremost diagnosticians, everything Dr. Barker writes is accepted as authoritative and of literary value.

The lectures and quizzes during the clinic period are full of interest. Subjects discussed in this volume are carcinoma of left bronchus, infectious diseases, certain diseases of respiratory apparatus, circulation, digestion, blood, urogenital system, metabolism, nervous system, internal secretion, etc. It is a most excellent collection of subjects ably handled.

Practical Zoology. For Medical and Junior Students. By J. D. F. Gilchrist, M.A., D.Sc., Ph.D., Professor of Zoology, University of Cape Town, and C. von Bonde, M.A., Lecturer in Zoology, University of Cape Town. With 329 pages, illustrated. New York: William Wood & Co., and Edinburgh: E. & S. Livingstone, 1922. Cloth, $4.00.

The illustrations and diagrams of this text book from South Africa are clear and accurate. Some species of plants or animals common in Africa and rare in other parts of the world are described, but these are supplemented with types common in the temperate zone. The book is well adapted for pre-medical courses in the Southern or Northern hemisphere.

SOUTHERN MEDICAL ASSOCIATION

Minutes of the Sixteenth Annual Meeting, Chattanooga, Tennessee November 13-16, 1922

Monday, November 13, 8:00 p. m.—First General Session.

The Association met in the First Baptist Church, Chattanooga, Tenn., and was called to order by Dr. John B. Steele, General Chairman of the Committee on Arrangements.

INVOCATION

Rev. John W. Inzer, Pastor First Baptist Church, was introduced and delivered the following invocation:

Our dear Heavenly Father, we thank Thee for this occasion, for this splendid body of men who have come together in our City on this important mission. We thank Thee, our Father, that these doctors desire their meeting to be opened with prayer. We thank Thee that healing was a great part of the ministry of the Lord Jesus Christ, and that these splendid men, through their scientific discoveries and their devotion to truth, have been able to help fulfill one of His great prophesies, when He said, "I go to my Father, but greater things than these shall ye do." We have been able to see with our own eyes in surgery and medicine wonderful miracles wrought. We hope that you will give these men every day to see how much they are contributing and how much more they may contribute to the welfare of humanity and the oncoming of the Kingdom of God. Empower them to find the whole truth and nothing but the truth. Bless them as they come to our City. May they learn to love us and may we love them. May they have a splendid time. May they learn helpful things about their own work. Care for and bless their loved ones at home, and if one of these brothers has ought to be anxious about now, keep that thing for him, Father, and bless them here. Forgive us all our sins and keep us, for Jesus' sake. Amen.

Following the invocation Rev. Inzer spoke informally as follows:

As Pastor of this Church, Dr. Steele has asked me to say one or two words tendering the use of the Church and putting ourselves at your service. I do not know of anything a church could be used for in the week days that would be better than a meeting of such splendid men as you doctors. We are glad to have this house used by you doctors; and it will not be desecrated in any way. We hope you will like our City, where we are trying to show you our Southern hospitality. I wish I could become acquainted with you all. I wish the Texas fellows would stand up. I am from Texas and I love that State very much. (Those from Texas rose.) My wife is from Alabama, so I wish the Alabama fellows would stand up, too. (Those from Alabama complied with this request.) We are glad to see all of you. I am sorry that this meeting came at the same time as our State Convention, which meets in Knoxville tomorrow. I know I am going to miss a good time with all you fellows. I shall turn you over to Dr. Wise and some of the other good fellows here; and I know we have some of the best in America. They would not say that for themselves, but I will say it for them. I am not going to Baltimore to have my operation. I shall have it done here.

Now, I shall tell you my best doctor's joke and then I shall be through. There were three old fellows down in Arkansas in the evening time of life who were talking about old times. They were Dr. Hancock, one 'Squire Leslie and a Mr. Ward. The Doctor told a pretty good story on 'Squire Leslie and then the 'Squire said in a quavering voice: "Now, I'll tell one on you. When old Mr. Ward was sick, I said to Mrs. Ward: 'Do you know that your husband is very sick?' 'Yes.' 'Well, why don't you call old Dr. Hancock?' 'What's the use? He's always drunk on Christmas day (it was Christmas day when this happened) and it's thirty miles to the next doctor and nobody will go.' I said: 'Well, it looks to me as if he was going to die, and I'd have old Hancock over to the dyin', anyhow.' She consented and had him come over in that Christmas condition. He came staggering in and finally got to the head of the bed and said to old man Ward: 'Let me see your tongue.' The old man stuck out his tongue and then Doc said, 'Let me feel your pulse.' Ward was so ill that he couldn't lift his hand and old Doc Hancock fumbled around and finally got hold of his own pulse and held on to it for a minute and then he said: 'Well, either you are very sick or you're on the awfullest drunk you ever had,'" and then old man Leslie said, "There's one thing you have to admit, and that is that old Hancock is all right on diagnosis."

ADDRESS OF WELCOME

Dr. John B. Steele, introducing Dr. E. B. Wise, who delivered the address of welcome, said:

"Ladies and Gentlemen: Sixteen years ago this Association was born in Chattanooga in the historic old Read House; and for the last seven years Chattanooga has attempted to have the honor of entertaining her child, and had all but given up hope. Last year at Hot Springs, when the Council was in session and the representatives from the different cities were in the ante-room waiting to make their plea that the Association meet with us in 1922, Dr. Stewart Roberts, representing the Atlanta delegation, turned to me with the following remark: "Steele, every time I attend the Southern Medical Association I find you fighting for Chattanooga, which reminds me of the following story: A young man was returning home in the dead of night, very much the worse for the evening entertainment. He passed a lighted dance hall and decided to participate in the merriment. The bouncer at the door espied his condition and gently but firmly threw him down stairs. He arose and ascended sweetly again, only to be more forcibly ejected. After the seventh ejection he sat miserably at the foot of the stairs and sobbed: 'I know what is the matter, mister you d-don't want me up there.'" I appeared before the Council to plead for Chattanooga and gave the story that Dr. Roberts told me and landed the convention. When I came in the church tonight I saw an ambulance at the door and I suppose it is for me, because I never was in the pulpit before.

We shall now listen to the address of welcome by one of the members of the original Tri-State Medical Society, who is one of the charter members of the Southern Medical Association and who now holds the position of Health Officer of this City. Besides this he is one of the best fellows in the world. It is a great pleasure to present to you Dr. E. B. Wise.

Dr. E. B. Wise, Director of Health, Chattanooga, in behalf of the Chattanooga Academy of Medicine and the Hamilton County Medical Society, delivered the following address of welcome:

Mr. Chairman, Ladies and Members of the Southern Medical Association: The Chattanooga and Hamilton County Academy of Medicine, through its Committee on Entertainment, honored me by asking me to speak a word of welcome to you on this eventful occasion. I assure you, my friends, I deem it not only a rare privilege, but indeed a very great pleasure, to look into your faces and tell you how delighted we are to welcome you as an Association back to the place of your birth and scenes of your childhood days; for it was here in this historic city in 1859 that you first looked out upon this busy, bustling world; not then the Southern Medical Association, as it is today, but the Tri-State Medical Society, composing the states of Alabama, Georgia and Tennessee, which in 1906 evolved into this, the second largest medical association on the American continent, carrying upon its roster the names of many physicians and surgeons who have become renowned in their profession, and whose fame extends from sea to sea.

I am sure each of you hopes to receive at our hands every courtesy that it is possible for us to offer you while you are in our midst, but some of you, no doubt, do not expect to be so royally entertained as we were last year at Hot Springs. There is a vast difference between hope and expectation, and I think the little Irish widow understood full well the

meaning of the two terms. Her husband, Pat, whom she knew better than any one else, had died; and she was bemoaning his death very much. When a friend said to her: "Bridget, why is it that you take Pat's death so hard? Don't you hope to meet him in Heaven?" she said, "Yes, I hope to meet Pat in Heaven, but I don't expect to."

We want you not only to hope, but to expect everything we possess, that you would have. If you were to go away from here displeased with the arrangements that we have made for you, you wuld break the heart of our gallant young Chairman, Dr. J. B. Steele, who has worked so hard to make this convention a success, and who is, in a great measure, responsible for your being here at this time. Comparison is not always odious. Hence, Dr. Steele cannot take exception to anything that I might say about a dog.

On one occasion it became necessary for the late Sam Jones to explain to his congregation the difference between Heaven and hell. Mr. Jones said he thought perhaps his dog could explain it better than he. He said he had a dog that delighted in jumping on, and beating up, every littie dog in the community. One day as he and Mrs. Jones were driving in a lane down near Cartersville, Ga., their old home, his dog trotting along underneath their buggy, a little fice jumped out into the road just ahead of them. Sam's dog took after him, and they were both going with the speed of the wind, when by some means his dog looked back and saw an immense dog bearing down upon him. His dog said to himself, "If I catch that little dog, that would be Heaven. If that big dog catches me, that will be hell."

My friends, may I speak a word of greeting on behalf of our City? You wear upon the lapels of your coat a dynamo, emblematic of the Dynamo City of Dixie, namely, Chattanooga. As a City we fling wide our gates that give you entrance, to partake of everything that we have. The dew on our mountains, the flowers in our valleys, the fish in our river, our sunlight and moonshine are all yours; but of the latter we would have you take in homeopathic doses, or it might burn its way into your very souls. I am here reminded of two ladies coming into Cincinnati on one occasion, one dressed in all of the habiliments of woe, and very sad; the other an elderly lady, and, by the way, an old maid, who thought if possible she would ascertain the cause of the other's sorrow and speak a word of comfort to her if she could. So she said: "My good lady, why this sadness on your part? Have you lost some member of your family?" She replied: "Yes, my husband has just died and I am taking his body down to Cincinnati to have it cremated." The old maid began to weep and answered: "For these many years I have been trying to get one husband, and this old sister has husbands to burn." We would have you not only see our historic and scenic surroundings, but have you visit our foundries, our factories, our mills, and schools, our hospitals and our churches. Then we would have you visit our "Silent Cities of the Dead."

Some of them may be historic by tragedies of cruel war. Go with us, if you please, to our National cemetery, one of the most beautiful in the whole country. Sleeping beneath its green lie 13,000 Union soldiers who went down to their deaths on the bloody battle fields of Missionary Ridge and Chickamauga; and beside them sleeping the eternal sleep are many veterans of the Spanish-American and World Wars. We would have you see our own little Confederate cemetery, unkept by a National Government, but tenderly cared for by gentle hands and loving hearts of our Southern women. There, sleeping beneath the shade of the trees, lie those who President Harding has recently and graciously said, "died for a cause they believed to be right."

Again, friends, I bid you thrice welcome, to our hearts, our homes and our City.

RESPONSE TO THE ADDRESS OF WELCOME

Dr. Steele, introducing Dr. W. S. Leathers, who responded to the address of welcome, said:

We shall now have a response to the address of welcome by one who, in my opinion, has done more for his State than any other man. He should go down as one of the greatest men Mississippi has ever had. Due to his efforts Mississippi is spending more today for the prevention of disease than any other state in the South. I am very glad to present to you Dr. W. S. Leathers, State Health Officer of Mississippi.

Dr. W. S. Leathers, State Health Officer of Mississippi, Jackson, Miss., in behalf of the Southern Medical Association, responded to the address of welcome as follows:

Mr. President, Dr. Steele, Ladies and Gentlemen: I wish to express my appreciation of the kind remarks Dr. Steele made. I should perhaps give away a little secret at this point. It was my privilege to be a member of the Council of this organization for a number of years, and each time we met during the past several years Dr. Steele was on hand in the interest of having this Association meet in Chattanooga, and I think it can be stated that in all probability it would not have been here at this time if it had not been for the persistent and progressive spirit of Dr. Steele. He made a remarkable fight to secure this meeting for Chattanooga this week and if you people who know him could have heard the splendid things he told us from time to time about this progressive City, with its historical setting and beautiful surroundings, I am sure you would have been proud of your citizen abroad.

It is a decided pleasure and privilege to represent this great organization in responding to the address of welcome. I have frequently said that in attending different scientific meetings I got the greatest pleasure out of the meetings of the Southern Medical Association because of the genuine fellowship which one experiences at these meetings. This is a sentiment which I think we all cherish from year to year and it is made sweeter by the friendships we make from time to time as we meet on these occasions.

Just recently I wrote to the Secretary of the Southern Medical Association for a list of the physicians who have served as Presidents and who have distinguished this body by their service and leadership. It is most pleasing to state that Tennessee has had the largest number of Presidents of any state. That matchless personality, Dr. G. C. Savage, of Nashville, was the third President of the Southern Medical Association, and I am justified in saying that we all esteem Dr. Savage not only because of his splendid character as a man, but for the reason that he has made a place for himself in scientific medicine and honored our profession by having made excellent scientific contributions and rendered a large service to the profession.

The second Tennessean who was elected President of this organization was that indomitable character, Dr. Frank Jones, of Memphis. All of us who know Dr. Jones love him. He is a man who expresses with courage his convictions and I think that one of the oustanding qualities of Dr. Jones, apart from his skill as a physician, is that he expresses in every act of his life that integrity of purpose which all admire as a man and as a citizen.

The third physician from Tennessee who served this organization as its President was Dr. Duncan Eve, of Nashville, a man who has enriched the profession because of his ability and skill as a surgeon. During the past year we had as our leader a man whom we respect and esteem because of his elegance of manner, his fluency of speech, and his skill as a physician and surgeon, Dr. Jere Crook, of Jackson, Tenn.

It seems a rather striking coincidence that we have had three meetings in this State prior to this one and one of them in Chattanooga, and Tennessee has also given to the Association four Presidents. We come again for the fourth meeting in Tennessee to bear homage of our friendly attitude and devotion to this great State.

In casting my mind about relative to some comments that I might make on this occasion the idea occurred to me that these men that I have named who have served as our Presidents, and others that might be mentioned, such as Dr. Lewellys F. Barker, of Baltimore; Dr. W. W. Crawford, of Mississippi; Dr. Edward H. Cary, of Texas; Dr. Stuart McGuire, of Virginia, and the others, have set a high standard for the membership of this organization. In view of the splendid leadership which we have had it seems to me, Ladies and Gentlemen, that this organization has exerted a large influence for good in our Southland. One of the great objectives of this body is the prevention and control of disease—the reduction of sickness and the decrease of the death rate among our people. I recall some years ago that our distinguished President, Dr. Seale Harris, made the remark to me that he felt that this organization perhaps could not live unless it had the vitalizing influence which comes through the service that we might render to the people of our respective states in the prevention of disease, and therefore he suggested and had organized what we now call the Section on Preventive Medicine and Public Health. This Section has wrought well for the people of the South. I think one of our greatest possessions is service to our people. The word "service" should be emblazoned on the minds of the physicians in this Association and should be inscribed on our hearts. I think the principle that the Great Physician enunciated that "Whosoever thinketh to save his life shall lose it, but whosoever loseth his life for my sake shall find it," is just as true, and even truer, today than it has ever been in the history of the world because we are becoming more enlightened and conscious of our responsibility. I

think, therefore, we should not forget the injunction that he who thinketh to save his life shall lose it, but he who loseth his life for my sake shall find it.

Dr. Wise, I wish to express to you in the name of the Southern Medical Association our great appreciation for the interest, cordiality and hospitality which the good people of the City are showing to the members of this Association. I wish to state to you, Sir, that we appreciate it from the bottom of our hearts and that we expect to have a royal good time.

BRIEF HISTORY OF THE SOUTHERN MEDICAL ASSOCIATION

Dr. Steele, introducing Dr. H. H. Martin, said:

Our next speaker was one of the organizers of the Association sixteen years ago, and had quite a good deal to do with drawing up the Constitution and By-Laws in the Read House the wonderful night the Association was born. You all know him, but it is my pleasure to present to you Dr. H. H. Martin.

Dr. H. H. Martin, Savannah, Ga., first President of the Southern Medical Association, gave the following "Brief History of the Southern Medical Association:"

Mr. President, Members of the Association, Ladies and Gentlemen: I feel much as Dr. Steele did—I have never before spoken from a pulpit and do not know what is going to happen. I have been asked to give you a brief history of the Southern Medical Association. It had its inception in the feeling that there was need for something different from the ordinary medical associations and societies as we knew them sixteen years ago. This was shortly after the reorganization of that great and indispensable institution which we know as the American Medical Association. At that time the county societies in each state were thoroughly organized and had become integral parts of the state associations and the state associations had in their turn become integral parts of the American Medical Association. As we felt it in those days, the objects of the American Medical Association were to better in every possible way the conditions of organized medicine; but there were so many obligations involved, including politics, including strenuous efforts on the part of conscientious, hard-working, self-sacrificing men to obtain important legislation on important subjects, that all of us realized at times that the great purpose of a medical association (the advancement of medical science) was not being realized to its fullest extent. The feeling that there was need of a body that could limit its work absolutely to the promotion of public health and to the advancement of the science of medicine was so prevalent at that time that it became possible for this organization to be launched and to attain the success that it has.

The first definite suggestion of such an organization came from the Academy of Medicine in Nashville, Tenn., if I am not mistaken, in 1906, through Dr. Savage, who has been mentioned by one of the former speakers. Dr. Savage addressed a letter to six Southern state medical societies, or to the presidents of these societies. It so happened that three of the presidents were young men, full of the energy of youth and full of enthusiasm for this idea. They entered into a personal correspondence which resulted in an agreement that they should attend a meeting of the Tri-State Medical Society of Tennessee, Georgia and Alabama at Chattanooga in 1906 to discuss ways and means of perfecting such an organization. Much to the surprise of all, the matter, when presented before the Tri-State Society of three hundred members, was so enthusiastically received that every one interested immediately got to work, and after one morning and one afternoon of discussion pro and con of the advisability and desirability of organizing a great Southern Medical Asssociation, having for its object nothing but the promotion of public health and the advancement of the science of medicine, leaving to the county societies, the state societies and the great American Medical Association all legislative matters—leaving to them the details of how and why a man should be a doctor, or how and why a man should not be a doctor—this Association, confining itself to scientific work only, was brought into existence. This organization was born almost in a moment. It was at that time that the approximately three hundred members of the Tri-State Society voted to merge that Society into this body.

Thus the Southern Medical Association was born and launched on its way. After struggling with many difficulties, we had the good fortune to meet with a great body of force and enthusiasm in the person of Dr. Oscar Dowling, whom we asked to take us under his wing and allow us the benefit of his medical journal. He went further than that: he went down in his pocket and dug up dollars, which were very scarce in those days, and he carried this expensive burden on his shoulders up to the year 1910. We had then been but four years in existence and with the wonderful help given us by Dr. Dowling we were growing our membership was increasing and despite some opposition we were adhering closely to our first declaration of principle. It was then that Dr. Dowling found it impossible to go on further and do what he had been doing. Again we had the good fortune to meet with a man who had the inspiration and the energy to take up this great burden, to go down in his pocket and pay out money and to work, work, work, day and night, not for himself and his family, but for this great principle that would live after he and you and I were gone. That man was Dr. Seale Harris, of Birmingham, your President.

I do not think it is necessary for me to go more fully into the details of this work. I do want to say to you however, that you owe your existence today, you, a body of nearly seven thousand members, who are still doing what you started out to do, doing only that and nothing more—you owe that to Oscar Dowling; you owe it to Seale Harris; and you owe it to all of those good men who have stood behind you. You have today great possibilities. This Medical Association is going to live. It is a proven necessity. It is a dynamic force. It is getting bigger and better every day. I commend it to you. You should be proud of being a member. The Association gives you the second best medical journal published in this Country today and you get this for a ridiculously small sum of money.

This, in brief, is the history of the Southern Medical Association; and it stands today as simple in its structure and as simple in its creed as on the day that it was born.

Dr. Steele, in introducing Dr. Seale Harris, President of the Southern Medical Association, said:

I always did like Dr. Martin and I think he saved me from an ambulance ride. He has told you all about the next speaker and I have the honor and pleasure of presenting to you our President, Dr. Seale Harris.

Dr. Seale Harris, Birmingham, Ala., then delivered his President's Address, his subject being "Nutrition: The Most Important Public Health Problem of Today."

Dr. Hubert A. Royster, Raleigh, N. C., delivered the Oration on Surgery, his subject being "Surgical Sense."

Dr. S. W. Welch, State Health Officer, Montgomery, Ala., delivered the Oration on Public Health, his subject being "Science versus Magic in the Evolution of Preventive Medicine."

Dr. C. C. Bass, New Orleans, La., delivered the Oration on Medicine, his subject being "Transformation of the Intestinal Flora."

The first general session then adjourned.

Thursday, November 16, 2:00 p. m.—Second and Last General Session.

The Association met in the First Baptist Church, Chattanooga, Tenn., and was called to order by the President, Dr. Seale Harris, who announced that the first order of business would be the report of the Council.

REPORT OF THE COUNCIL

Dr. H. H. Martin, Chairman of the Council, presented the following report for the Council:

To the Members of the Southern Medical Association:

You will recall that at the annual meeting last year in Hot Springs plans for the transfer of the ownership of the Southern Medical Journal to the Southern Medical Association were consummated and in accordance with instructions from that meeting the Association issued notes in lieu of the Journal stock and the stock certificates have been exchanged

for these Association's notes. The Southern Medical Journal Company is being liquidated as rapidly as possible. I am pleased to say that a number of the holders of the Journal stock have accepted life membership in the Association in lieu of their notes.

Owing to the very excellent organization of your central office there is so little business to be attended to at this session that the Council held but two meetings.

The first session of the sixteenth annual meeting of the Council convened in the private dining room of the Hotel Patten, Chattanooga, Tenn., Tuesday, November 15, at 12:30 p. m. Present: Dr. H. H. Martin, Georgia, Chairman; Dr. A. W. Ralls, Alabama; Dr. Wm. R. Bathurst, Arkansas; Dr. R. H. McGinnis, Florida; Dr. J. E. Knighton, Louisiana; Dr. Hiram Woods, Maryland; Dr. Jos. B. Greene, North Carolina; Dr. L. J. Moorman, Oklahoma; Dr. J. W. Jervey, South Carolina; Dr. William Litterer, Tennessee; Dr. Ennion G. Williams, Virginia; and Dr. T. W. Moore, West Virginia. Dr. Jabez Jackson, Missouri, Dr. Charles A. Vance, Kentucky, and Dr. Henry Boswell, Mississippi, represented their respective states at this Council meeting by appointment of the President, the regular Councilors being absent. Sitting with the Council: Dr. Seale Harris, President, and Mr. C. P. Loranz, Secretary-Manager.

The Council first considered the invitations for the 1923 meeting. Invitations in regular form were presented from Washington, D. C.; Baltimore, Md.; Richmond, Va.; Jacksonville, Fla., and Charlotte, N. C. Representatives from Baltimore, Richmond and Washington presented the claims of their cities for the 1923 meeting. After hearing these representatives and reading many letters and telegrams from the various individuals and civic clubs of these cities, Washington, D. C., was selected as our meeting place for next year.

The Section on Neurology and Psychiatry submitted resolutions giving certain rules and regulations governing future meetings of their Section. (See minutes of the Section, page 61, for full text of resolution.) The Council approved these resolutions and requests that officers of all sections give them their most careful and thoughtful consideration, as they embody a recommendation to the various sections made by the Council at our Louisville meeting in 1920. The Council desires to interfere as little as possible with the conduct of the section meetings, but does wish to impress upon all section officers the necessity for definite rules of conduct that will be more or less uniform in all the sections and that will be more strictly enforced than they have been in the past.

The Council then proceeded to the election of three members of the Board of Trustees to succeed Dr. Oscar Dowling, Dr. Duncan Eve, Sr., and Dr. E. H. Cary, whose terms expire this year. As has been the custom of the Council in the past, the oldest member in point of service, Dr. Oscar Dowling, was retired, and Dr. Seale Harris, our retiring President, was elected to fill this vacancy, Dr. Eve and Dr. Cary being re-elected. You will appreciate the advantages of this plan which, instead of permitting your retiring President to cease his active work after one year of service, keeps him in active service on the Board of Trustees for a term of six years.

Dr. Wm. R. Bathurst presented a request from the dermatologists of the South for a Section on Dermatology and Syphilology. He told the Council of the splendid organization meeting held on Monday. The Council approved the request and recommends that such a Section be created under the rules and regulations now prevailing. The Chairman announced the following officers for this new Section: Chairman, Dr. J. B. Shelmire, Dallas, Tex.; Vice-Chairman, Dr. J. L. Kirby-Smith, Jacksonville, Fla.; Secretary, Dr. J. M. King, Nashville, Tenn.

The Council then adjourned as an executive body, but remained in session informally, as has been our custom when time permitted, for a half hour or more discussing in an informal way matters of importance and interest to the Association. Among other things the Chairman took this opportunity to express to Dr. Barker and Dr. Woods, of Maryland; Dr. McGuire, of Virginia, and Dr. Groover and Dr. Williams, of Washington, their appreciation of the Council for the most cordial invitations extended by these gentlemen in behalf of their cities for the Association's 1923 meeting.

The Council then adjourned until Wednesday, November 15, at 12:30 p. m.

The second session of the sixteenth annual meeting of the Council convened in the private dining room of the Hotel Patten, Chattanooga, Tenn., Wednesday, November 15, at 12:30 p. m. Present: Dr. H. H. Martin, Georgia, Chairman; Dr. A. W. Ralls, Alabama; Dr. R. H. McGinnis, Florida; Dr. J. E. Knighton, Louisiana; Dr. Jos. B. Greene, North Carolina; Dr. L. J. Moorman, Oklahoma; Dr. J. W. Jervey, South Carolina; Dr. William Litterer, Tennessee; Dr. Ennion G. Williams, Virginia, and Dr. T. W. Moore, West Virginia. Dr. Charles A. Vance, Kentucky; Dr. Clarence M. Grigsby, Texas; Dr. Henry Boswell, Mississippi; and Dr. W. T. Wootton, Arkansas, represented their respective states at this Council meeting by appointment of the President, the regular Councilors being absent. Sitting with the Council: Dr. Seale Harris, President, and Mr. C. P. Loranz, Secretary-Manager.

Dr. Oscar Dowling, Chairman of the Board of Trustees, presented the report of the Board, which incorporated the report of the Secretary-Manager. The report of the Board of Trustees was approved by the Council and recommended for adoption, as was also the report of the Secretary-Manager transmitted to the Council by the Trustees with their approval.

REPORT OF THE TRUSTEES

To the Council of the Southern Medical Association:

The Board of Trustees of the Southern Medical Association met in annual session at the Hotel Patten, Chattanooga, Tenn., Monday, November 13, at 12:30 p. m. Present: Dr. Oscar Dowling, Chairman, Dr. Robert Wilson, Jr., Dr. Duncan Eve, Sr., Dr. Lewellys F. Barker, Dr. E. H. Cary and Dr. Jere L. Crook. Sitting with the Trustees: Dr. Seale Harris, the Association's President, Dr. W. W. Crawford, and Mr. C. P. Loranz, Secretary-Manager.

The Board was called to order by the Chairman, Dr. Oscar Dowling. It was noted that every member of the Board was present.

The Secretary-Manager, Mr. C. P. Loranz, then read his report, giving in detail the financial condition of the Association. The conduct of the affairs of the Association by the Secretary-Manager, and his report, were approved by the Board.

Dr. Harris was instructed to have the books of the Association audited for the fiscal year ending October 31, 1922, the period covered by the report of the Secretary-Manager.

A discussion as to proper compensation for the Secretary-Manager was had and upon motion carried unanimously the salary of the present Secretary-Manager was fixed at $5,000.00 per year, retroactive to November 1, 1921, and to be in effect until changed by this Board.

The Publication Committee as provided for last year was continued.

It was mentioned by a member of the Board that many business enterprises are now carrying insurance on valuable employees and that it would be good business for the Association to carry some insurance, payable to the Association, on the life of the present Secretary-Manager, as his death might disrupt a smooth working organization and some financial loss to the Association be sustained while a new Secretary-Manager was getting the work in hand. It was ordered that a ten-year term policy for $10,000.00 be taken out on the life of Mr. Loranz, said policy payable to the Southern Medical Association.

Dr. Harris told of the recent illness of a former member of this Board, Dr. James M. Jackson, and Dr. Harris was requested to send him a telegram of sympathy and good wishes from the Board.

After an informal discussion of the affairs of the Association the Board adjourned.

(Signed) OSCAR DOWLING, Chairman.

REPORT OF THE SECRETARY-MANAGER

To the Southern Medical Association:

At the Hot Springs meeting last year the Southern Medical Journal was taken over by purchase and we assumed full charge and control on November 15, 1921. Acting under orders of the Board of Trustees, through their Chairman, Dr. Oscar Dowling, the details of the purchase were worked out legally and notes in payment of the stock were issued and stock taken up. The Journal Company is being liquidated as rapidly as possible.

During this past year, as your Secretary-Manager, I have tried to render a faithful and satisfactory service, having at all times the interest of the Association before me, and my acts have been, to the best of my knowledge and belief, for the best interest of the Association.

I give you here a detailed financial statement, which is self-explanatory. From this you will see we have had a fairly successful year, having earnings on our books in excess of the amount due for Journal purchase notes.

Last year we had 6238 members and during the year we have received 1186 new members. This past year we lost from resignations, deaths and suspensions for failure to pay dues 664, leaving a net membership at this time of 6760. As part of this report there is a

BALANCE SHEET

Balance Sheet, Southern Medical Association, November 1, 1921, to October 31, 1922

Investment (cost of Journal)		$ 55,000.00	
Surplus (Oct. 31, 1921)			$ 856.96
Notes Payable (Jour. Pur.)			52,300.00
Furniture and Fixtures		1,204.84	
Depreciation			180.00
Profit and Loss		190.00	
Advertising	$16,981.78		
Dues	19,715.50		
Life Memberships	2,700.00		
Subscriptions	997.20		
Reprints	162.69		
Exhibits (Hot Springs)	2,077.50		
Paper Stock	247.98		
Interest and Discount	1.23—		42,883.88
Publishing	$13,114.06		
Cuts and Electros	764.53		
Salary	9,663.14		
Section Stenographers	1,380.49		
Stationery & Printing	2,860.13		
Journal Wrappers	535.96		
Office Sup. & Expense	440.27		
Second Class Postage	720.00		
Office Postage	2,162.24		
Telegraph & Telephone	307.59		
Office Rent	661.25		
Advertising Com.	529.73		
Subscription Com.	11.25		
Advertising Expense	60.00		
Addressograph Ex.	46.56		
Press Clippings	55.00		
Traveling Expense	1,121.55		
Expense at Hot Spgs	988.15		
Journal Subscriptions	687.00		
General Expense	157.40—	36,266.30	
Accounts Receivable (owe us)		3,437.92	
Accounts Payable (we owe)			4,596.24
Cash		4,718.02	
		$100,817.08	$100,817.08

Total Revenue Accounts	$42,883.88
Total Expense Accounts	36,266.30
Gross Profit	$ 6,617.58
Less Profit and Loss Account	190.00
Net Profit for year	$ 6,427.58

SURPLUS ACCOUNT

Surplus October 31, 1921	$ 856.96
Net earnings year ending 10-31-22	6,427.58
Surplus October 31, 1922	$ 7,284.54

STATEMENT OF ASSETS AND LIABILITIES

October 31, 1922

Assets

Investment (Cost of Journal)	$55,000.00
Office Furniture and Fixtures	1,024.84
Accounts Receivable (owe us)	3,437.92
Cash	4,718.02
	$64,180.78

Liabilities

Notes Payable (Jour. Purchase Notes)	$52,300.00
Accounts Payable (we owe)	4,596.24
Surplus	7,284.54
	$64,180.78

detailed statement of our membership by states for the past eleven years.

I want to express my appreciation to all who have been associated with me at headquarters, to the officers of the Association, and to our members, for their hearty cooperation this past year. I pledge anew my best efforts to the Association and hope that I may continue to merit your confidence and esteem.

(Signed) C. P. LORANZ, Secretary-Manager.

Communications from several individual members were read and informally discussed. These communications were referred to the Chairman of the Council for such action as he deemed necessary. There was also some discussion on the question of rules governing section meetings, which was concluded by the Chairman again impressing upon the members of the Council that it is not the policy of this body to exercise too great a paternalism or control over the section work.

The Council then heard the report from the special committee provided for at the last annual meeting to investigate the merits of all claimants to the honor of being the discoverer of anesthesia. Here is the report of the Committee:

To the Southern Medical Association:

At the last General Session of the Southern Medical Association held in Hot Springs, Arkansas, November 14-17, 1921, a resolution was adopted instructing the President of the Association to appoint a committee to be composed of one physician from each state comprising the Association to investigate the merits of all claimants to the honor of being the discoverer of anesthesia, giving the matter proper and careful attention, and to report to the Association at its next annual meeting.

Pursuant to this resolution the President appointed the following committee:

Dr. Frank K. Boland, Chairman, Atlanta, Ga.
Dr. W. W. Harper, Selma, Ala.
Dr. W. F. Smith, Little Rock, Ark.
Dr. H. H. Hazen, Washington, D. C.
Dr. F. C. Moor, Tallahassee, Fla.
Dr. Louis Frank, Louisville, Ky.
Dr. E. Denegre Martin, New Orleans, La.
Dr. Hugh H. Young, Baltimore, Md.
Dr. W. W. Crawford, Hattiesburg, Miss.
Dr. Vilray P. Blair, St. Louis, Mo.
Dr. F. Webb Griffith, Asheville, N. C.
Dr. Horace Reed, Oklahoma City, Okla.
Dr. Robert Wilson, Jr., Charleston, S. C.
Dr. Samuel S. Briggs, Nashville, Tenn.
Dr. M. L. Graves, Galveston, Tex.
Dr. Stuart McGuire, Richmond, Va.
Dr. George D. Jeffers, Parkersburg, W. Va.

During the past twelve months this Committee has investigated this matter very carefully and thoroughly and has considered all literature available on the subject. The Committee met at the Hotel Patten, Chattanooga,

The following is a comparative statement of the membership of the Southern Medical Association by states for the past eleven years:

MEMBERSHIP BY STATES

	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
Alabama	210	294	353	377	498	528	501	553	512	549	631
Arkansas	10	138	190	196	227	242	229	283	279	330	411
District of Columbia	11	24	52	68	66	56	48	48	55	64	64
Florida	188	210	250	276	278	252	192	204	204	222	261
Georgia	186	200	254	293	477	638	502	629	576	567	589
Kentucky	14	110	205	283	261	226	173	189	347	434	445
Louisiana	188	174	230	282	286	277	216	254	228	244	318
Maryland	20	38	74	119	130	178	151	166	205	219	218
Mississippi	245	336	308	291	286	314	328	372	388	395	438
Missouri	...	...	...	...	108	112	107	111	178	203	233
North Carolina	37	102	248	274	303	347	290	353	431	435	480
Oklahoma	...	25	181	107	207	203	173	187	195	269	294
South Carolina	30	79	171	176	242	266	221	263	285	341	358
Tennessee	182	212	302	320	410	491	500	538	533	511	688
Texas	31	147	204	607	1100	1025	923	902	800	841	708
Virginia	35	106	238	371	356	314	299	300	324	333	315
West Virginia	7	32	55	76	70	71	51	56	200	185	230
Other states	...	5	8	30	35	55	89	58	55	66	79
Totals	1243	2257	3382	4096	5340	5628	5183	5466	5795	6238	6760

Tenn., November 14, 1922, with the following members being present:

Drs. Boland, Moor, Frank, Crawford, Griffith, Reed, Wilson and McGuire.

After considerable discussion of the various claimants and a review of the literature and correspondence relating to the subject, the following resolution was adopted:

"Whereas, Unmistakable proof shows that Crawford W. Long used sulphuric ether to produce surgical anesthesia in Jefferson, Georgia, on March 30, 1842; and,

"Whereas. Undoubted records show that this was the first time in history that ether was ever used for this purpose; therefore, be it

"Resolved, That the Southern Medical Association, in annual session at Chattanooga, Tenn., November 13-16, 1922, declares that Crawford W. Long, and none other, was the discoverer of anesthesia, and is entitled to the credit and honor for an achievement of such inestimable benefit to medicine and to humanity."

(Signed) FRANK K. BOLAND, Chairman,
For the Committee.

The report of this special Committee was approved by the Council and recommended for adoption.

Dr. J. W. Jervey, South Carolina, called attention to the value of there being compiled a complete abstract of all evidence reviewed in the investigations of this Committee and of its being published in book or pamphlet form for the information of the members of the Association. It was moved and carried that the suggestion of Dr. Jervey be carried out by the Association office if it was found practicable and the Association's finances would permit.

The Chairman read a letter from our honored ex-President, Dr. James M. Jackson, of Miami, Fla., expressing his great disappointment and regret at being deprived of the privilege of attending this meeting and extending his greetings and best wishes to each and every member of the Association. It was noted that Dr. Jackson was rapidly convalescing from his recent major operation. The President, Dr. Harris, was instructed to send Dr. Jackson a telegram expressing to him our sympathy and love and our sincere regret that for the first time in many years Dr. Jackson was absent from an annual meeting of the Association, and wishing for him a speedy return to good health.

The Chairman called attention to the fact that Dr. Seale Harris, the retiring President, served this organization faithfully and well for eleven years as Secretary-Editor and "general booster" and that he had consistently refused to accept any compensation for this valuable service other than permitting the Association to pay his personal expenses to the annual meeting for the last few years of his service. Since Dr. Harris was no longer Secretary-Editor, and was retiring at this meeting as an active officer of the Association, the Chairman requested that he be permitted to authorize the Secretary-Manager to pay Dr. Harris' personal expenses to this meeting. This request was most enthusiastically granted. (Dr. Harris was not in the Council room when this action was taken.)

Dr. Seale Harris, retiring President, told of the recommendation of the retiring President of the American Medical Association to divide the United States into certain districts and branches of the American Medical Association and that a committee was now investigating this recommendation. The following resolutions were presented and unanimously approved by the Council and recommended for adoption:

Whereas, A committee has been appointed by the American Medical Association to investigate the advisability of organizing branch or district medical associations in various parts of the United States as suggested by their retiring President; and,

Whereas, The organization of such district associations would, in our opinion, be a detriment to the work that is already being done by the Southern Medical Association and which field it has had for the past sixteen years; and,

Whereas, We believe that the organization of such district associations would also lessen the prestige of our great National association, the American Medical Association, to which we all are loyal; therefore, be it

Resolved, That the Southern Medical Association, at its sixteenth annual session in Chattanooga, Tenn., November 13-16, 1922, expresses regret that it cannot approve the proposed plan to organize district branches of the American Medical Association; and, be it further

Resolved, That the Southern Medical Association, the sole function of which is to promote the advancement of scientific medicine and public health in the sixteen Southern states, urges the Committee to give an unfavorable report on the question of district medical associations as integral parts of the American Medical Association.

Dr. M. Y. Dabney presented a request from the Medical Directors of Southern Life Insurance Companies for a Section of Medical Directors of Southern Life Insurance Companies to hold one luncheon or dinner session with three scientific papers. He told of an organization dinner meeting held on Tuesday night and that he represented that meeting in presenting this request. The request for this Section was granted and the following officers, elected at the organization meeting subject to the approval of the Council, were approved by the Council: Chairman, Dr. John B. Steele, Chattanooga, Tenn.; First Vice-Chairman, Dr. J. W. Handley, Nashville, Tenn.; Secretary, Dr. R. C. Maddox, Chattanooga, Tenn.

The Council heard a most delightful address from Dr. Paul J. Gelpi, President of the State Medical Association of Louisiana, asking for an expression of approval by the Council of his proposed plan for the establishment of a home for the care of indigent members of the profession. The Council most heartily gave its approval of the general idea expressed by Dr. Gelpi.

The Chairman appointed the following Committee on Scientific Awards: Dr. R. H. McGinnis, Chairman, Jacksonville, Fla.; Dr. E. A. Hines, Seneca, S. C., and Dr. James R. Garber, Birmingham, Ala.

The Council then adjourned as an executive body to meet in Washington, D. C., November, 1923, and reassembled as the Nominating Committee for the general officers of this Association. The Chairman ruled that the Council could in its discretion nominate an Editor of the Journal for a period of one, three or five years. The Council nominations will be presented to you in regular order of business following your action on this report.

(Signed) H. H. MARTIN,
Chairman of the Council.

After the reading of the Report of the Council, the President, Dr. Seale Harris, commented as follows:

Before action is taken on this report of the Council I would like to say that the last few years of my service as Secretary-Editor I permitted the Association to pay my expenses in attending the annual meetings, but this action of the Council was taken without my knowledge or consent, and I must insist that that provision shall not be carried out. The honor of being President is enough without the Association's paying my expenses to this meeting. In fact, under no circumstances will I accept it. I am like the Virginia gentleman who on one occasion had sent to him some brandy peaches. He wrote thanking the giver and said: "I do not care much for peaches, but I greatly appreciate the spirit in which they are sent." I appreciate greatly the spirit of the Council, and with the elimination of that paragraph I shall ask for a motion to adopt the Report of the Council.

Dr. J. O. Elrod, Forsyth, Ga., moved that the report of the Council, with the exception of the paragraph referred to by Dr. Harris, be adopted. Seconded and unanimously carried.

REPORT OF COMMITTEE ON SCIENTIFIC AWARDS

The report of the Committee on Scientific Awards was read by Dr. H. H. Martin, Chairman of the Council, as follows:

To the Southern Medical Association:

We, your Committee on Scientific Awards appointed by the Council, visited the scientific exhibits and went over them very carefully. We understand that we are to make three awards, one for the best exhibit by an individual physician, one for the best by a medical school, and one for the best by a public health agency.

For the best exhibit by an individual physician we make the award to Dr. Vilray P. Blair, St. Louis, Mo., for his exhibit of plaster casts, photographs and drawings of his work in the reconstruction of facial deformities.

For the best exhibit by a medical school we make the award to Vanderbilt University, School of Medicine, Department of Pathology, for its exhibit of gross pathology, lantern slides, photos and a rapid stain for the diagnosis of malignancy.

For the best exhibit by a public health agency the award is to the State Board of Health of Alabama for its exhibit showing work on malaria control.

We desire to give honorable mention to the exhibit of the State Board of Health of South Carolina for its malaria exhibit.

The two malaria exhibits mentioned are units of the very extensive and complete exhibit on malaria assembled under the direction of the National Malaria Committee, showing very effective work done in malaria control throughout the South. We desire to make special mention of the malaria exhibit as a whole.

The Committee found the scientific exhibits interesting and well arranged. It is gratifying to note that the exhibits are more numerous this year than at previous meetings and we urge that the members of the Association in our territory cooperate in making the scientific exhibits more and more a feature of the annual meetings.

(Signed) R. H. McGINNIS, Chairman
E. A. HINES.
JAS. R. GARBER, Committee.

REPORT OF NOMINATING COMMITTEE

Dr. H. H. Martin, Chairman of the Council, read the report of the Nominating Committee.

The Council, as your official Nominating Committee, presents for your consideration the following:

For President, Dr. W. S. Leathers, Jackson, Miss.

For First Vice-President, Dr. Lawrence T. Royster, Norfolk, Va.

For Second Vice-President, Dr. John B. Steele, Chattanooga, Tenn.

For Editor of Journal for three years, Dr. M. Y. Dabney, Birmingham, Ala.

(The Secretary-Manager, Mr. C. P. Loranz, Birmingham, Ala., was elected last year for a term of five years.)

The President stated that any one had a right to make further nominations at this time from the floor and asked if there were any such nominations.

Dr. J. O. Elrod, Forsyth, Ga., moved that the nominees presented by the Nominating Committee be unanimously elected. Motion seconded and unanimously carried.

The new President, Dr. W. S. Leathers, was escorted to the platform. Dr. Seale Harris, the retiring President, in presenting Dr. Leathers to the Association, said:

The Nominating Committee of the Southern Medical Association, in naming its officers, has considered two things: first, ability, distinction, and general fitness for the various positions; and second, service to the Southern Medical Association. I believe the Council has never made a mistake in serving as the Nominating Committee with the exception of last year, and surely they have made no mistake this year, because in selecting our President for the next twelve months they have chosen a man who ranks among the most distinguished medical men of the United States. In the field of public health, Dr. Leathers is the peer of any man in the world. The Mississippi State Board of Health has made wonderful and remarkable progress in the prevention of disease in Mississippi. Just let me mention one thing they have done. Two years ago they persuaded the Legislature of Mississippi to appropriate $1,400,000 for tuberculosis work in that State.

Dr. Leathers has rendered valuable service to the Southern Medical Association. Originally we had but three sections: Medicine, Surgery, and Eye, Ear, Nose and Throat. Ten years ago when we decided to establish a Section on Public Health Dr. Leathers was called upon to prepare the program and interest public health officials in the South in that Section. I may say that the first program Dr. Leathers prepared was as good as any program of any Section on Public Health of any medical organization in the Country, and that the Section on Public Health is today one of our greatest sections. The health officers all over the South are present at our meetings every year and that Section is doing great good for the upbuilding of the South.

It gives me great personal pleasure to introduce the next President of your Association, because he and I were boys together at the University of Virginia. I have known him during all these years. I have watched his career with great pride, and he has been my devoted friend. I take great pleasure in presenting your new President, Dr. W. S. Leathers, of Jackson, Miss., who will now take charge of the meeting.

Dr. W. S. Leathers, the newly elected President, in accepting the Presidency, said:

Mr. President, Ladies and Gentlemen: I think no greater honor could come to any man than to become President of this great organization. During the past several years when all of us have been striving to build up the Southern Medical Association, it has been a genuine pleasure to me to participate in that undertaking. I know of no service I have rendered in my lifetime which has been sweeter and more satisfying than the service I have rendered this organization, and I am especially proud of the fact that I have the privilege and honor of following my good friend, Dr. Seale Harris. As he mentioned, we have been friends for years, but apart from that friendship it has been a source of real satisfaction to serve this organization because of the great service which it can render to the Southern physicians and to the medical profession of the South, and in fact, the entire Country.

There are physicians from Mississippi in this audience, and I wish to say that I am devoted to the medical profession of my own State. I have been associated with these men for many years. They have been kind to me and have been a great help in my work. I want them to share this honor with me. I want them to share not only this honor, but also share the responsibility that goes with it. I want to promise you that during the next year it will be a genuine pleasure for me to continue the service which I have endeavored to render in an humble way to this organization. We have some problems that need to be solved, and these problems can only be solved by the interest and cooperation of all of us. I feel that one of the most important things for us to do during the next year is to increase our membership. We have a membership at present of 6,800 physicians, and I want to pledge you my energy and my effort, asking you to pledge your cooperation to make our membership during this year not less than 10,000 physicians.

I appreciate this honor more than I can express and I intend to serve you during the coming year to the very best of my capacity. I look forward with great pleasure to the meeting in Washington, and I trust we may have the largest and most successful meeting we have had during the history of this organization.

Dr. John B. Steele, in accepting the Second Vice-Presidency, said:

They are doing funny things these days—Andy Gump was elected by thirty-seven votes, and I guess that is the way I got here.

We have enjoyed your stay, gentlemen. If I had not had such loyal men behind me we could not have arranged such a successful meeting. I wish to thank you for the honor you have bestowed upon me and my colleagues in Chattanooga.

SYMPOSIUM ON GALL-BLADDER DISEASE

The Association then proceeded with the program of the Symposium on Gall-Bladder Disease, Dr. W. S. Leathers, the newly elected President, presided.

Dr. Martin E. Rehfuss, Philadelphia, Pa., read a paper entitled "Gall-Bladder Disease."

Dr. Irvin Abell, Louisville, Ky., read a paper entitled "Surgical Treatment of Diseases of the Gall-Bladder."

Papers of Dr. Rehfuss and Dr. Abell were discussed by Drs. W. A. Bryan, Nashville, Tenn.; A. L. Levine, New Orleans, La.; C. W. Dowden, Louisville, Ky.; Seale Harris, Birmingham, Ala., and in closing by Dr. Rehfuss.

The Association then adjourned to meet in Washington, D. C., November 12-15, 1923.

SECTION ON MEDICINE

Officers

Chairman—Dr. M. L. Graves, Galveston, Tex.
Vice-Chairman—Dr. Loyd Thompson, Hot Springs, Ark.
Secretary—Dr. Allan Eustis, New Orleans, La.

Monday, November 13, 2:00 p. m.

The Section met in the Auditorium, County Court House, Chattanooga, Tenn., and was called to order by the Chairman, Dr. M. L. Graves, Galveston, Tex., who read his Chairman's Address entitled "Clinical Studies" (with lantern slides).

Dr. Sidney K. Simon and Dr. J. Holmes Smith, New Orleans, La., presented a paper entitled "The Value of the Glucose Tolerance Test in the Diagnosis of Malignant Growths of the Digestive Tract," which was discussed by Drs. Julius Fiedenwald, Baltimore, Md.; John A. Lanford, New Orleans, La.; Bryce W. Fontaine, Memphis, Tenn.; W. H. Olmsted, St. Louis, Mo., and in closing by Dr. Simon.

Dr. C. W. Strickler, Atlanta, Ga., read a paper entitled "The Diagnosis of Abdominal Adhesions," which was discussed by Drs. Willis F. Westmoreland, Atlanta, Ga.; George M. Niles, Atlanta, Ga.; Sidney R. Miller, Baltimore, Md.; W. R. Houston, Augusta, Ga.; W. R. Ward, Birmingham, Ala.; Tom A. Williams, Washington, D. C., and in closing by the essayist.

Dr. J. T. Wolfe, Washington, D. C., read a paper entitled "Ileo-Cecal Delay and Vagus Reflex as Etiologic Factors in Bronchial Asthma," which was discussed by Drs. W. W. Duke, Kansas City, Mo.; Sidney R. Miller, Baltimore, Md.; A. L. Levin, New Orleans, La.; E. C. Thrash, Atlanta, Ga.; Allan Eustis, New Orleans, La., and in closing by the essayist.

Dr. A. G. Kelley, Atlanta, Ga., read a paper entitled "Sugar Findings in Normal and Pathological Spinal Fluids," which was discussed by Drs. John A. Lanford, New Orleans, La.; Kenneth M. Lynch, Dallas, Tex.; Tom A. Williams, Washington, D. C., and in closing by the essayist.

Dr. I. I. Lemann, New Orleans, La., read a paper entitled "Renal Glycosuria," which was discussed by Drs. J. E. Paullin, Atlanta, Ga.; W. H. Olmsted, St. Louis, Mo.; Louis V. Hamman, Baltimore, Md.; H. Y. Wrighton, Savannah, Ga., and in closing by the essayist.

The Section adjourned until 2 p. m. Tuesday.

Tuesday, November 14, 2:00 p. m.

The Section was called to order by the Chairman.

Dr. Lewellys F. Barker, Baltimore, Md., read a paper entitled "Etiology and Pathology of Tetany."

Dr. Stewart R. Roberts, Atlanta, Ga., read a paper entitled "Diagnosis and Treatment of Tetany."

Papers of Dr. Barker and Dr. Roberts were discussed by Drs. E. Bates Block, Atlanta, Ga.; W. McKim Marriott, St. Louis, Mo.; William Engelbach, St. Louis, Mo.; W. A. Mulherin, Augusta, Ga.; Douglas VanderHoof, Richmond, Va., and in closing by the essayists.

Dr. Bryce W. Fontaine, Memphis, Tenn., read a paper entitled "Aplastic Anemia; Report of a Case; Differential Diagnosis of the Anemias Due to the Hemolysis and to Hematopoietic Degeneration," which was discussed by Drs. C. W. Dowden, Louisville, Ky.; William Litterer, Nashville, Tenn.; Randolph Lyons, New Orleans, La.; Tom A. Williams, Washington, D. C.; Sidney R. Miller, Baltimore, Md., and in closing by the essayist.

Dr. William Howard Lewis, Rome, Ga., read a paper entitled "The Twilight Zone of Diagnosis," which was discussed by Drs. Sidney R. Miller, Baltimore, Md.; Ernest B. Bradley, Lexington, Ky.; David C. Walt, Little Rock, Ark., and in closing by the essayist.

Dr. Thomas P. Sprunt, Baltimore, Md., read a paper entitled "Lipodystrophia Progressiva; Report of Two Cases, One of Which Showed Improvement Under Medical Treatment," which was discussed by Drs. Lewellys F. Barker, Baltimore, Md.; Walter Baumgarten, St. Louis, Mo.; E. Bates Block, Atlanta, Ga., and in closing by the essayist.

The Section adjourned until 2:00 p. m. Wednesday.

Wednesday, November 15, 2:00 p. m.

The Section was called to order by the Chairman.

Dr. David Riesman, Philadelphia, Pa., read a paper entitled "The Riddle of Uremia."

Dr. James S. McLester, Birmingham, Ala., read a paper entitled "Diet in Chronic Nephritis."

Dr. Douglas VanderHoof and Dr. Charles C. Haskell, Richmond, Va., presented a paper on "The Relation of Acidosis to Nitrogen Retention in Experimental Nephritis."

Papers of Dr. Riesman, Dr. McLester and Drs. VanderHoof and Haskell were discussed by Drs. Louis V. Hamman, Baltimore, Md.; Ellsworth S. Smith, St. Louis, Mo.; W. H. Olmsted, St. Louis, Mo.; Frank A. Jones, Memphis, Tenn.; Stewart R. Roberts, Atlanta, Ga.; W. McKim Marriott, St. Louis, Mo., and in closing by Dr. Riesman and Dr. McLester.

Dr. Chas. H. Cocke, Asheville, N. C., read a paper entitled "Vaccines in the Treatment of Secondary Infections in Pulmonary Tuberculosis," which was discussed by Drs. Louis V. Hamman, Baltimore, Md.; L. J. Moorman, Oklahoma City, Okla.; R. E. Flack, Asheville, N. C.; Virgil E. Simpson, Louisville, Ky.; J. T. Wolfe, Washington, D. C.; R. B. McBrayer, Sanatorium, N. C.; W. R. Kirk, Hendersonville, N. C., and in closing by the essayist.

Dr. Albert Keidel and Dr. J. E. Kemp, Baltimore, Md., presented a paper on "Deafness in Late Congenital Syphilis," which was discussed by Dr. Loyd Thompson, Hot Springs, Ark., and in closing by Dr. Keidel.

Dr. W. R. Houston, Augusta, Ga., read a paper entitled "Therapeutic Effectiveness," which was discussed by Drs. Virgil E. Simpson, Louisville, Ky.; Seale Harris, Birmingham, Ala.; Eugene Lyman Fisk, New York, N. Y., and David C. Walt, Little Rock, Ark.

The Section proceeded to the election of officers with the following result:

Chairman: Dr. Allan Eustis, New Orleans, La.
Vice-Chairman: Dr. Douglas VanderHoof, Richmond, Va.
Secretary: Dr. Sydney R. Miller, Baltimore, Md.

The Section then adjourned sine die.

SECTION ON PEDIATRICS

Officers

Chairman—Dr. J. Ross Snyder, Birmingham, Ala.
Vice-Chairman—Dr. L. R. DeBuys, New Orleans, La.
Secretary—Dr. Oliver W. Hill, Knoxville, Tenn.

Tuesday, November 14, 9:30 a. m.

The Section met in the Stone Church, Chattanooga, Tenn., and was called to order by the Chairman, Dr. J. Ross Snyder, Birmingham, Ala., who read his Chairman's Address entitled "The Problem of the Negro Child."

Dr. Harold Ruckman Mixsell and Dr. Emanuel Giddings, New York, N. Y., presented a paper entitled "A Study of 3,000 Cases of Measles with Special Reference to Pneumonia."

Dr. E. A. Hines, Seneca, S. C., read a paper entitled "Historical Sketch of the Development of Pediatrics in the South," which was discussed by Drs. Owen H. Wilson, Nashville, Tenn.; H. Leslie Moore, Dallas, Tex.; L. T. Royster, Norfolk Va.; W. A. Mulherin, Augusta, Ga., and in closing by the essayist.

Dr. C. R. Hannah, Dallas, Tex., read a paper entitled "The Influence of the Obstetrician for Breast Feeding," which was discussed by Drs. Eugene Rosamond, Memphis, Tenn.; Charles Conrad, Harrisonburg, Va.; Arthur G. Jacobs, Memphis, Tenn.; A. A. Walker, Birmingham, Ala.; Robert A. Strong, New Orleans, La.; J. R. Garber, Birmingham, Ala.; B. M. Taylor, Greensboro, Ky., and W. A. Mulherin, Augusta, Ga.

Dr. C. Hilton Rice, Montgomery, Ala., read a paper entitled "Food and Life," which was discussed by Drs. L. T. Royster, Norfolk, Va.; W. L. Funkhouser, Atlanta, Ga.; J. H. Graves, Houston, Tex., and in closing by the essayist.

Dr. A. J. Waring, Savannah, Ga., read a paper entitled "Sectional Feeding," which was discussed by Drs. W. A. Mulherin, Augusta, Ga.; R. M. Pollitzer, Charleston, S. C.; John Zahorsky, St. Louis, Mo.; Lewis W. Elias, Asheville, N. C.; Jerome Meyer, Birmingham, Ala.; Robert A. Strong, New Orleans, La.; S. G. Glover, Greenville, S. C.; John Barbee, Knoxville, Tenn.; B. M. Taylor, Greensboro, Ky.; W. A. Ross, Jacksonville, Fla., and in closing by the essayist.

Dr. Stewart H. Welch, Birmingham, Ala., read a paper entitled "Congenital Syphilis," which was discussed by Drs. W. L. Funkhouser, Atlanta, Ga.; J. H. Mason Knox, Jr., Baltimore, Md.; N. C. Womack, Jackson, Miss.; Arthur G. Jacobs, Memphis, Tenn., and in closing by the essayist.

The Chairman appointed Dr. L. T. Royster, Norfolk, Va., to serve on the Executive Committee in the absence of Dr. J. D. Love.

The Section adjourned until 9:30 a. m. Wednesday.

Wednesday, November 15, 9:30 a. m.

The Section was called to order by the Chairman.

The Chairman appointed a Memorial Committee consisting of Drs. C. E. Boynton, Atlanta, Ga., and E. A. Hines, Seneca, S. C., to draw up resolutions on the death of Dr. L. B. Clarke, of Atlanta, Ga.

Dr. L. T. Royster, Norfolk, Va., read a paper entitled "Tonsils," which was discussed by Drs. N. C. Womack, Jackson, Miss.; H. Leslie Moore, Dallas, Tex.; Jerome Meyer, Birmingham, Ala.; John Zahorsky, St. Louis, Mo.; W. W. Harper, Selma, Ala.; W. McKim Marriott, St. Louis, Mo.;

R. J. Estell, Lexington, Ky.; Philip F. Barbour, Louisville, Ky.; E. Rosamond, Memphis, Tenn.; Arthur G. Jacobs, Memphis, Tenn.; Owen H. Wilson, Nashville, Tenn., and in closing by the essayist.

Dr. Frank H. Richardson, Black Mountain, N. C., and Brooklyn, N. Y., read a paper entitled "Group Practice in Pediatrics," which was discussed by Drs. R. C. Spence, Dallas, Tex.; Robert A. Strong, New Orleans, La.; Charles E. Boynton, Atlanta, Ga., and in closing by the essayist.

Dr. John Zahorsky, St. Louis, Mo., read a paper entitled "Pediatrics in the Home and in the Hospital," which was discussed by Drs. Lewis W. Elias, Asheville, N. C.; J. O. Elrod, Forsyth, Ga.; Jerome Meyer, Birmingham, Ala.; Robert A. Strong, New Orleans, La.; H. Leslie Moore, Dallas, Tex.; A. J. Waring, Savannah, Ga.; W. A. Mulherin, Augusta, Ga.; N. C. Womack, Jackson, Miss., and in closing by the essayist.

Dr. Lewis W. Elias, Asheville, N. C., read a paper entitled "Some Practical Points on Purgation," which was discussed by Drs. Charles Boynton, Atlanta, Ga.; Owen H. Wilson, Nashville, Tenn.; A. A. Walker, Birmingham, Ala.; J. F. Haley, San Antonio, Tex.; R. M. Pollitzer, Charleston, S. C.; Lewis Smith, Milltown, Ga.; W. A. Mulherin, Augusta, Ga.; R. C. Spence, Dallas, Tex.; C. Hilton Rice, Montgomery, Ala., and in closing by the essayist.

Dr. Arthur G. Jacobs, Memphis, Tenn., read a paper entitled "Diphtheria with Unusual Complications," which was discussed by Drs. W. A. Mulherin, Augusta, Ga.; Lewis W. Elias, Asheville, N. C.; J. H. Graves, Houston, Tex.; John Barbee, Knoxville, Tenn.; W. McKim Marriott, St. Louis, Mo., and in closing by the essayist.

The Section adjourned until 9:30 a. m. Thursday.

Thursday, November 16, 9:30 a. m.

The Section was called to order by the Chairman.

Dr. Eugene Rosamond, Memphis, Tenn., read a paper entitled "Malaria in Children and the Abuse of Quinin," which was discussed by Drs. J. O. Elrod, Forsyth, Ga.; W. A. Mulherin, Augusta, Ga., and in closing by the essayist.

Dr. J. H. Mason Knox, Jr., Baltimore, Md., read a paper entitled "The European Child Health Program of the American Red Cross," which was discussed by Drs. W. A. Mulherin, Augusta, Ga.; W. L. Mitchell, St. Louis, Mo.; R. R. McHenry, Seligman, Mo.; Frank H. Richardson, Black Mountain, N. C.; Philip F. Barbour, Louisville, Ky.; John Barbee, Knoxville, Tenn., and in closing by the essayist.

CASE REPORT SESSION

Drs. W. A. Mulherin and V. P. Sydenstricker, Augusta, Ga., reported a case of "Septic Meningitis in a Five-Year-Old Child," which was discussed by Drs. W. McKim Marriott, St. Louis, Mo.; A. A. Walker, Birmingham, Ala., and in closing by Dr. Mulherin.

Dr. Ralph C. Spence, Dallas, Tex., reported a case of "Congenital Syphilis with Ascites," which was discussed by Dr. Charles Boynton, Atlanta, Ga.

Dr. Philip F. Barbour, Louisville, Ky., reported a case of "Convulsions Followed by Amnesia," which was discussed by Drs. Owen H. Wilson, Nashville, Tenn.; John Zahorsky, St. Louis, Mo.; Arthur G. Jacobs, Memphis, Tenn., and in closing by the essayist.

Dr. R. M. Pollitzer, Charleston, S. C., reported a case of "Pneumonia and Syphilis of the Nervous System," which was discussed by Drs. N. C. Womack, Jackson, Miss., and John Zahorsky, St. Louis, Mo.

Dr. J. Buren Sidbury, Wilmington, N. C., reported a case of "Transfusion Through the Umbilical Vein," which was discussed by Drs. W. L. Funkhouser, Atlanta, Ga.; W. McKim Marriott, St. Louis, Mo.; A. A. Walker, Birmingham, Ala.; S. G. Glover, Greenville, S. C.; Oliver H. Hill, Knoxville, Tenn.; Eugene Rosamond, Memphis, Tenn.; J. H. Mason Knox, Jr., Baltimore, Md., and in closing by the essayist.

Drs. Harvey G. Beck and Ferdinand A. Reis, Baltimore, Md., reported a case of "Family Group of Typhoid Simulating Meningitis," which was discussed by Dr. James H. Atlee, Chattanooga, Tenn., and in closing by Dr. Beck.

Dr. Philip F. Barbour, Louisville, Ky., announced that Dr. Henry Enos Tuley, of Louisville, who had been a very active member of the Section, had suffered an attack of acute dilatation of the heart and was very ill. He was slowly recovering and it was hoped he would be able to resume his work. He moved that the Secretary be instructed to send a letter of sympathy to Dr. Tuley, wishing him speedy return to health. The motion was unanimously carried by a rising vote.

Dr. W. A. Mulherin, Augusta, Ga., offered the following report from the Executive Committee:

"The Executive Committee beg leave to report the following resolutions:

"Whereas, The Section on Pediatrics is at this hour terminating a most successful meeting, and,

"Whereas, The members of this Section have been the recipients of many courtesies and acts directed toward their comfort, entertainment and pleasure, therefore, be it

"Resolved, That this Section extend a hearty vote of thanks to

"1. The local Committee on Arrangements,

"2. The Chattanooga Academy of Medicine and the Hamilton County Medical Society,

"3. The First Methodist Church,

"4. Dr. James H. Atlee, of Chattanooga, Tenn."

The Executive Committee nominates as officers of this Section for the ensuing year:

For Chairman: Dr. W. McKim Marriott, St. Louis, Mo.
For Vice-Chairman: Dr. H. Leslie Moore, Dallas, Tex.
For Secretary: Oliver W. Hill, Knoxville, Tenn.

It was moved and unanimously carried that the first resolution presented by the Executive Committee be adopted.

There being no other nominations, the nominees for officers of the Section were unanimously elected.

Dr. Charles Boynton, Chairman of the Memorial Committee, presented the following resolution:

"Whereas, It has come to the notice of the Section on Pediatrics of the Southern Medical Association that one of our esteemed members, Dr. L. B. Clarke, of Atlanta, Ga., has passed away since our last meeting, held at Hot Springs, Ark.; and,

"Whereas, Dr. Clarke was a pioneer in pediatrics in the South, both as a teacher and a contributor to the literature; therefore, be it

Resolved, That we feel keenly the loss of one of our fellow workers in this important branch of medicine. Be it further

"Resolved, That these resolutions be spread on the minutes of this Section, published in the Southern Medical Journal, and copies of same sent to his widow and son."

The resolution was adopted unanimously by a rising vote.

Upon motion of Dr. Mulherin a rising vote of thanks was given to the retiring officers for the very efficient way in which they conducted the meeting.

The Section then adjourned sine die.

SECTION ON NEUROLOGY AND PSYCHIATRY

Officers

Chairman—Dr. E. Bates Block, Atlanta, Ga.
Vice-Chairman—Dr. M. L. Graves, Galveston, Tex.
Secretary—Dr. L. L. Cazenavette, New Orleans, La.

Wednesday, November 15, 9:30 a. m.

The Section met in the Auditorium, County Court House, Chattanooga, Tenn., and was called to order by the Chairman.

The following resolutions were presented by Dr. G. H. Benton and unanimously adopted:

1. The officers shall be a Chairman, a Vice-Chairman, and a Secretary, each to serve for one year, or until an election is held.

2. The three officers shall form a Program Committee.

3. The program shall be completed by the Secretary ninety days before the meeting and submitted to all members of the Committee for their selection and ratification before final adoption by the Committee.

4. The Secretary of the Section should forward the program to the Secretary-Manager of the Southern Medical Association sixty days before the meeting.

5. The sentiment of the Section is that an effort should be made to have only one paper from each state unless the program would otherwise remain incomplete, or unless the papers offered are of such importance that the Program Committee feels that they should be presented.

6. The Secretary shall keep a minute book, and at the end of each meeting he shall have the minutes transcribed in the book and deliver it to his successor.

7. The Secretary shall keep a registration book at each Section meeting, in which all who attend the Section meeting shall register their name and home address.

8. A Section dinner shall be held on the evening of the first meeting each year and tickets placed on sale at the end of the first meeting each year and advance information

should be obtained by the Secretary thirty days before the meeting by means of a reply postal card in order to determine the probable number.

9. The Nominating Committee shall consist of the three ex-Chairmen, and in case of the absence of any of these, their place shall be filled by an appointment made by the Chairman.

10. The order of business at the final meeting of the Section shall be:

(1) Reading minutes.
(2) Unfinished business.
(3) Committee reports.
(4) New business.
(5) Report of Nominating Committee.
(6) Election of officers.
(7) Installation of officers.
(8) Adjournment.

Dr. E. Bates Block, Atlanta, Ga., read his Chairman's Address entitled "A Case of Epilepsy with Megacolon (Hirschsprung's Disease)."

Dr. Beverley R. Tucker, Richmond, Va., read a paper entitled "Atrophic Conditions Contrasted with Muscular Wasting from Emaciation" (with lantern slides), which was discussed by Drs. C. E. Dowman, Atlanta, Ga.; Tom A. Williams, Washington, D. C.; M. L. Graves, Galveston, Tex.; H. S. Ward, Birmingham, Ala.; and in closing by the essayist.

Dr. Charles M. Byrnes, Baltimore, Md., read a paper entitled "Singultus Crisis in Tabes," which was discussed by Drs. Lewis M. Gaines, Atlanta, Ga.; Tom A. Williams, Washington, D. C.; L. L. Cazenavette, New Orleans, La., and in closing by the essayist.

Dr. Ralph N. Greene, Jacksonville, Fla., read a paper entitled "Arterial Hypertension," which was discussed by Drs. Lewis M. Gaines, Atlanta, Ga.; David C. Walt, Little Rock, Ark.; J. F. Yarbrough, Columbia, Ala.; Robert Wilson, Jr., Charleston, S. C.; Virgil E. Simpson, Louisville, Ky.; Tom A. Williams, Washington, D. C., and in closing by the essayist.

Dr. Newdigate M. Owensby, Atlanta, Ga., read a paper entitled "Paramyoclonus Multiplex Epilepticus," which was discussed by Dr. Beverley R. Tucker.

The Chairman then appointed the following as a Nominating Committee: Drs. Tom A. Williams, Washington, D. C.; Ross McC. Chapman, Towson, Md., and W. R. Houston, Augusta, Ga.

The Section adjourned until 9:30 a. m. Thursday.

Thursday, November 16, 9:30 a. m.

The Section was called to order by the Chairman.

Dr. Noland D. C. Lewis, Washington, D. C., read a paper entitled "An Anatomical Study of Contrasting the Dementia Praecox Constitution with That of Paranoid Developments" (with lantern slides), which was discussed by Drs. Beverley R. Tucker, Richmond, Va.; Tom A. Williams, Washington, D. C.; R. C. Swint, Milledgeville, Ga.; R. M. Chapman, Towson, Md.; J. W. Quillian, Chattanooga, Tenn., and in closing by the essayist.

Dr. George L. Echols, Milledgeville, Ga., read a paper entitled "The Mental Disease Problem," which was discussed by Drs. R. C. Swint, Milledgeville, Ga.; M. L. Graves, Galveston, Tex.; M. A. Bliss, St. Louis, Mo.; Ralph N. Greene, Jacksonville, Fla; R. McBrayer, Sanatorium, N. C.; George P. Sprague, Lexington, Ky.; Nolan D. C. Lewis, Washington, D. C.; J. W. Quillian, Chattanooga, Tenn., and in closing by the essayist.

Dr. W. C. Ashworth, Greensboro, N. C., read a paper entitled "The Importance of Early Recognition and Diagnosis and Treatment of Mental Disorders."

Dr. L. R. Brown, Fondren, Miss., read a paper entitled "The Psychopathic Child in School," which was discussed by Dr T. W. Evans, Alexandria, La., and in closing by the essayist.

Dr. George F. Roeling, New Orleans, read a paper entitled "The Needs of Neuropsychiatric Research."

The Nominating Committee reported as follows, the nominees being unanimously elected:

For Chairman: Dr. W. G. Somerville, Memphis, Tenn.
For Vice-Chairman: Dr. Beverley R. Tucker, Richmond, Va.
For Secretary: Dr. G. H. Benton, Miami, Fla.

The Chairman, Dr. Block, stated that the members of the Section were all interested in the advancement of neurologic and psychiatric knowledge in the South, and called attention to the importance of inaugurating some system of keeping uniform records of cases, so that neurologists and psychiatrists in different parts of the United States could avail themselves of the advantages and benefits of such records.

It was moved and carried that a committee of three be appointed by the Chairman to act as an advisory committee to formulate certain prescribed records for mental cases.

The Chairman appointed on this Committee: Drs. M. A. Bliss, St. Louis, Mo.; L. R. Brown, Fondren, Miss., and R. M. Chapman, Towson, Md.

The Section then adjourned sine die.

SOUTHERN GASTRO-ENTEROLOGICAL ASSOCIATION

Meeting conjointly with Southern Medical Association.

Officers

President—Dr. Marvin H. Smith, Jacksonville, Fla.
Vice-President—Dr. Julius Friedenwald, Baltimore, Md.
Secretary—Dr. J. B. Fitts, Atlanta, Ga.

Monday, November 13, 9:30 a. m.

The Southern Gastro-Enterological Association, meeting conjointly with the Southern Medical Association, met in the Auditorium, County Court House, Chattanooga, Tenn., and was called to order by the President, Dr. Marvin H. Smith, Jacksonville, Fla., who read his President's Address entitled "Some Observations on Carbohydrate Metabolism."

Dr. A. W. Calloway, Asheville, N. C., read a paper entitled "The Relation of Gastro-enterology to Other Specialties," which was discussed by Drs. George M. Niles, Atlanta, Ga.; W. R. Houston, Augusta, Ga.; Tom A. Williams, Washington, D. C., and in closing by the essayist.

Dr. J. Russell Verbrycke, Jr., Washington, D. C., read a paper entitled "The Association of Cardiospasm with Cardiovascular Disease."

Dr. Julius Friedenwald, Baltimore, Md., read a paper entitled "Spasm of the Cardia and Cardiospasm."

Papers of Dr. Verbrycke and Dr. Friedenwald were discussed by Drs. Charles G. Lucas, Louisville, Ky.; Elmer B. Freeman, Baltimore, Md.; Sidney K. Simon, New Orleans, La.; A. L. Levin, New Orleans, La.; A. L. Gray, Richmond, Va., and in closing by the essayists.

Dr. John B. Fitts, Atlanta, Ga., read a paper entitled "Cancer of the Stomach with a Review of Fifty Operatively and Pathologically Proven Cases," which was discussed by Drs. Julius Friedenwald, Baltimore, Md.; George M. Niles, Atlanta, Ga.; J. Russell Verbrycke, Jr., Washington, D. C.; John L. Jelks, Memphis, Tenn., and in closing by the essayist.

Dr. D. N. Silverman, New Orleans, La., read a paper entitled "Tropical Sprue and Its Relationship to Disturbances of Pancreatic Digestion," which was discussed by Drs. John L. Jelks, Memphis, Tenn.; J. E. Knighton, Shreveport, La.; A. W. Calloway, Asheville, N. C.; J. F. Yarbrough, Columbia, Ala., and in closing by the essayist.

The Association adjourned until 9:30 a. m. Tuesday.

Tuesday, November 14, 9:30 a. m.

The Association was called to order by the President.

Dr. A. L. Levin, New Orleans, La., read a paper entitled "Digestive Hemolysis as a Test of Liver Function and the Influence Upon it by Hepatic Extract," which was discussed by Drs. George M. Niles, Atlanta, Ga.; Julius Friedenwald, Baltimore, Md.; D. N. Silverman, New Orleans, La.; R. McBrayer, Sanatorium, N. C.; J. F. Yarbrough, Columbia, Ala.; Charles G. Lucas, Louisville, Ky.; D. D. Shanks, Atlanta, Ga., and in closing by the essayist.

Dr. George M. Niles, Atlanta, Ga., read a paper entitled "A Physiologic and Philosophic Study of the Relation of Sleep to Bodily Nutrition," which was discussed by Drs. Julius Friedenwald, Baltimore, Md.; A. W. Calloway, Asheville, N. C.; Tom A. Williams, Washington, D. C.; Seale Harris, Birmingham, Ala.; George L. Echols, Milledgeville, Ga.; Henry C. Clark, Falmouth, Ky., and in closing by the essayist.

Dr. George C. Mizell, Atlanta, Ga., read a paper entitled "Bacillus Acidophilus; Results of Feeding Milk Cultures," which was discussed by Drs. Charles G. Lucas, Louisville, Ky.; Sidney K. Simon, New Orleans, La.; C. C. Bass, New Orleans, La.; Seale Harris, Birmingham, Ala.; John L. Jelks, Memphis, Tenn., and in closing by the essayist.

Dr. Sidney K. Simon, New Orleans, La., read a paper entitled "Ileo-Colon Stasis; Its Clinical Significance and Treatment," which was discussed by Drs. A. W. Calloway, Asheville, N. C.; John L. Jelks, Memphis, Tenn.; Julius Friedenwald, Baltimore, Md.; Willard P. Whittington, Asheville, N. C.; A. L. Levin, New Orleans, La., and in closing by the essayist.

In an executive session following the close of the scientific program the following officers were elected for the ensuing year:

President: Dr. Julius Friedenwald, Baltimore, Md.
Vice-President: Dr. J. E. Knighton, Shreveport, La.
Secretary: Dr. John B. Fitts, Atlanta, Ga.

The Association then adjourned sine die.

SECTION ON RADIOLOGY

Officers

Chairman—Dr. Thomas A. Groover, Washington, D. C.
Vice-Chairman—Dr. Robert H. Millwee, Dallas, Tex.
Secretary—Dr. E. C. Ernst, St. Louis, Mo.

Monday, November 13, 2:00 p. m.

The Section met in the Criminal Court Room, County Court House, Chattanooga, Tenn., and was called to order by the Chairman.

In the absence of the Secretary, Dr. C. C. Phillips, Charlotte, N. C., was elected Secretary pro tem.

The Chairman read a telegram from Dr. O. H. McCandless, Kansas City, Mo., one of the pioneers in the development of this Section, expressing regret at being unable to attend the meeting on account of a recent illness.

Dr. T. A. Groover, Washington, D. C., read his Chairman's Address entitled "The Relation of Radiology to Cancer Control," which was discussed by Drs. A. L. Gray, Richmond, Va.; E. C. Thrash, Atlanta, Ga.; W. P. Whittington, Asheville, N. C.; L. B. McBrayer, Sanatorium, N. C., and in closing by the essayist.

Dr. J. W. Landham, Atlanta, Ga., read a paper entitled "X-Ray Versus Radium in the Treatment of Uterine Hemorrhage," which was discussed by Drs. E. C. Samuel, New Orleans, La.; W. P. Whittington, Asheville, N. C.; George E. Adkins, Jackson, Miss.; D. Y. Keith, Louisville, Ky.; L. B. McBrayer, Sanatorium, N. C., and in closing by the essayist.

Dr. W. A. Weed, Birmingham, Ala., read a paper entitled "A Few Points in Radio Therapeutic Technique," which was discussed by Drs. W. P. Whittington, Asheville, N. C.; John S. Derr, Atlanta, Ga., and in closing by the essayist.

Dr. C. C. Phillips, Charlotte, N. C., read a paper entitled "Obstruction of the Bronchi by Non-Opaque Foreign Bodies" (with lantern slides), which was discussed by Drs. A. L. Gray, Richmond, Va.; M. F. Arbuckle, St. Louis, Mo.; E. C. Samuel, New Orleans, La.; N. C. Womack, Jackson, Miss.; W. S. Lawrence, Memphis, Tenn.; A. L. Gray, Richmond, Va., and in closing by the essayist.

The Section adjourned until 2:00 p. m. Tuesday.

Tuesday, November 14, 2:00 p. m.

The Section was called to order by the Chairman.

Dr. W. R. Bethea, Memphis, Tenn., was elected Secretary pro tem.

Dr. R. H. Millwee, Dallas, Tex., read a paper entitled "Further Observations in the Use of High Voltage X-Ray."

Dr. Sherwood Moore, St. Louis, Mo., read a paper entitled "High Voltage X-Ray Therapy; A Six Months' Experience."

Drs. D. Y. and J. Paul Keith, Louisville, Ky., presented a paper entitled "Our Experience in the Use of Deep Therapy, 200 Kilovolts or More."

Dr. W. S. Lawrence, Memphis, Tenn., read a paper entitled "The Diagnosis and Treatment of Certain Mediastinal Tumors."

The Symposium on Deep Therapy, papers of Dr. Milwee, Dr. Moore, Drs. D. Y. and J. P. Keith, and Dr. Lawrence, was discussed by Drs. E. C. Ernst, St. Louis, Mo.; C. A. Waters, Baltimore, Md.; William Neill, Jr., Baltimore, Md.; C. C. Phillips, Charlotte, N. C.; W. P. Whittington, Asheville, N. C.; J. J. Clark, Atlanta, Ga.; D. Y. Keith, Louisville, Ky.; R. H. Millwee, Dallas, Tex.; Sherwood Moore, St. Louis, Mo., and W. S. Lawrence, Memphis, Tenn.

Drs. Charles A. Waters and Paul B. MacCready, Baltimore, Md., presented a paper entitled "Late Results Following the X-Ray Treatment of Chronically Infected Tonsils and Adenoids," which was discussed by Drs. Virgil Dark, Montgomery, Ala.; W. P. Whittington, Asheville, N. C.; George E. Adkins, Jackson, Miss., and in closing by the essayist.

The Nominating Committee, composed of Drs. E. C. Samuel, New Orleans, La.; A. L. Gray, Richmond, Va., and W. S. Lawrence, Memphis, Tenn., appointed by the Chairman, presented the following report, these nominees being unanimously elected:

For President: Dr. D. Y. Keith, Louisville, Ky.
For Vice-President: Dr. J. W. Landham, Atlanta, Ga.
For Secretary: Dr. W. R. Bethea, Memphis, Tenn.

The Section then adjourned sine die.

Tuesday, November 14, 6:30 p. m.

Joint dinner session with Section on Surgery, Read House.

Dr. George W. Crile, Cleveland, Ohio, read a paper entitled "Surgical Treatment of Hyperthyroidism" (with lantern slides).

Dr. George W. Holmes, Boston, Mass., read a paper entitled "Radiation Treatment of Hyperthyroidism" (with lantern slides).

SECTION ON DERMATOLOGY AND SYPHILOLOGY

Organization Meeting

Organization Chairman—Dr. Marcus Haase, Memphis, Tenn.
Organization Secretary—Dr. Earl D. Crutchfield, Galveston, Tex.
Organization Committee—Dr. Everett S. Lain, Oklahoma City, Okla., and Dr. W. R. Bathurst, Little Rock, Ark.

Monday, November 13, 3:00 p. m.

The Section met in the ballroom of the Hotel Patten, Chattanooga, Tenn., and was called to order by the Organization Chairman.

The privileges of the floor were extended to the Section's guest, Dr. Wm. Allen Pusey, Chicago, Ill.

Dr. Jack W. Jones, Atlanta, Ga., read a paper entitled "Ultra Violet Ray Therapy in Dermatology," which was discussed by Drs. Wm. Allen Pusey, Chicago, Ill.; J. M. King, Nashville, Tenn.; C. F. Casenberg, Knoxville, Tenn.; Everett S. Lain, Oklahoma City, Okla.; Thomas W. Murrell, Richmond, Va.; A. L. Glaze, Jr., Birmingham, Ala.; J. B. Shelmire, Dallas, Tex.; Cosby Swanson, Atlanta, Ga., and in closing by the essayist.

At the request of the Chairman, Dr. Victor G. Heiser, International Health Board, introduced Dr. R. M. Wilson, Presbyterian Mission Hospital, Kwangju, Korea, who read a paper entitled "Progress in the Treatment of Leprosy" (with lantern slides), which was discussed by Drs. J. B. Shelmire, Dallas, Tex.; J. L. Kirby-Smith, Jacksonville, Fla.; Earl D. Crutchfield, Galveston, Tex.; Wm. Allen Pusey, Chicago, Ill.; Wm. H. Mook, St. Louis, Mo.; Victor G. Heiser, New York, N. Y., and in closing by the essayist.

Dr. J. B. Shelmire, Dallas, Tex., showed lantern slides demonstrating dermatological cases, which were discussed by Drs. Wm. Allen Pusey, Chicago, Ill.; M. B. Hutchins, Atlanta, Ga.; J. L. Kirby-Smith, Jacksonville, Fla.; Everett S. Lain, Oklahoma City, Okla.; J. M. King, Nashville, Tenn.; Earl D. Crutchfield, Galveston, Tex.; Marcus Haase, Memphis, Tenn., and in closing by the essayist.

Paper of Dr. I. L. McGlasson, San Antonio, Tex., entitled "Negative Wassermann in Dermatology," was read by title.

It was moved and carried that a report be made to the Council of the Southern Medical Association of this successful organization meeting and of the large number in attendance, and that a request be presented to the Council for a Section on Dermatology and Syphilology, the officers of the Section to be appointed by the Chairman of the Council if the request for the Section was granted. Dr. Lain and Dr. Bathurst, the Organization Committee, were appointed to present the request to the Council.

Immediately following the program and business session there was a dinner at the Hotel Patten, at which the Section was addressed by Dr. Wm. Allen Pusey, Chicago, Ill.

The Section then adjourned sine die.

At a meeting of the Council held Tuesday, November 14, Dr. Wm. R. Bathurst presented the request of the organization meeting for a Section on Dermatology and Syphilology—this request the Council granted. The Chairman of the Council named the following for Section officers for the coming year:

Chairman: Dr. J. B. Shelmire, Dallas, Tex.
Vice-Chairman: Dr. J. L. Kirby-Smith, Jacksonville, Fla.
Secretary: Dr. J. M. King, Nashville, Tenn.

SECTION ON SURGERY

Officers

Chairman—Dr. Hugh H. Trout, Roanoke, Va.
Vice-Chairman—Dr. Irvin Abell, Louisville, Ky.
Secretary—Dr. J. W. Barksdale, Winona, Miss.

Tuesday, November 14, 9:30 a. m.

The Section met in the First Baptist Church, Chattanooga, Tenn., and was called to order by the Chairman.

Dr. George T. Tyler, Greenville, S. C., read a paper entitled "Further Experience with Synergistic Analgesia," which was discussed by Drs. Frank D. Smythe, Memphis, Tenn.; John Darrington, Yazoo City, Miss.; Bertram H. Wagnon, Atlanta, Ga.; C. N. Cowden, Nashville, Tenn., and in closing by the essayist.

Dr. Brodie C. Nalle, Charlotte, N. C., read a paper entitled "Ovarian Cysts in Children, with Report of Cases," which was discussed by Drs. Lucius E. Burch, Nashville, Tenn.; Arthur W. Ralls, Gadsden, Ala.; Wm. T. Black, Memphis, Tenn.; T. S. Field, Jacksonville, Fla.; Robert B. McIver, Jacksonville, Fla.; C. N. Cowden, Nashville, Tenn., and in closing by the essayist.

Dr. W. A. Bryan, Nashville, Tenn., read a paper entitled "Correction of Cleft Palate," which was discussed by Drs. J. Shelton Horsley, Richmond, Va.; C. W. Allen, New Orleans, La.; Joseph E. Johnson, Memphis, Tenn., and in closing by the essayist.

Dr. R. M. Harbin, Rome, Ga., read a paper entitled "A Review of Six Cases of Meckel's Diverticulum, with Reference to Caution in Resections," which was discussed by Drs. J. Shelton Horsley, Richmond, Va.; George T. Tyler, Greenville, S. C.; F. Webb Griffith, Asheville, N. C., and Wm. T. Black, Memphis, Tenn.

Dr. Carroll W. Allen, New Orleans, La., read a paper entitled "Thyroidectomy Under Local Anesthesia," which was discussed by Drs. George W. Crile, Cleveland, Ohio, and Robert E. McIver, Jacksonville, Fla.

Dr. Charles A. Vance, Lexington, Ky., read a paper entitled "Intestinal Rupture from External Trauma, Without Extra-Abdominal Evidence," which was discussed by Drs. George A. Hendon, Louisville, Ky.; W. A. Bryan, Nashville, Tenn.; Duncan Eve, Sr., Nashville, Tenn.; James T. Leeper, Lenoir City, Tenn., and J. M. Clack, Rookwood, Tenn.

Section adjourned until 9:30 a. m. Wednesday.

Tuesday, November 14, 6:30 p. m.

Joint dinner session with Section on Radiology, Read House.

Dr. Geo. W. Crile, Cleveland, Ohio, read a paper entitled "Surgical Treatment of Hyperthyroidism" (with lantern slides).

Dr. Geo. W. Holmes, Boston, Mass., read a paper entitled "Radiation Treatment of Hyperthyroidism" (with lantern slides).

Wednesday, November 15, 9:30 a. m.

The Section was called to order by the Vice-Chairman.

Dr. Hugh H. Trout, Roanoke, Va., read his Chairman's Address entitled "The Post-Hospital Care of Surgical Patients."

Dr. Dean Lewis, Chicago, Ill., read a paper entitled "Osteomyelitis" (with lantern slides), which, at his request, was discussed by Dr. Isidore Cohn, New Orleans, La.

The Vice-Chairman expressed to Dr. Lewis the appreciation of the Section for his coming to our meeting and his presentation of osteomyelitis.

Dr. Jabez N. Jackson, Kansas City, Mo., read a paper entitled "Acute Gangrenous Suppurative Retrocecal Appendicitis," which was discussed by Drs. Richard A. Barr, Nashville, Tenn.; Stuart McGuire, Richmond, Va.; Francis LeS. Reder, St. Louis, Mo.; R. M. Harbin, Rome, Ga.; James T. Wolfe, Washington, D. C.; Jere L. Crook, Jackson, Tenn., and in closing by the essayist.

Dr. William Neill, Jr., Baltimore, Md., read a paper entitled "The Consideration of the Treatment of Carcinoma of the Bladder," which was discussed by Drs. John T. Geraghty, Baltimore, Md.; William F. Braasch, Rochester, Minn.; Edgar G. Ballenger, Atlanta, Ga.; H. W. E. Walther, New Orleans, La., and in closing by the essayist.

Dr. M. J. Henry, Louisville, Ky., read a paper entitled "Peptic Ulcer and Its Surgical Treatment," which was discussed by Drs. Irvin Abell, Louisville, Ky.; Lucius E. Burch, Nashville, Tenn.; Charles G. Lucas, Louisville, Ky.; James B. McElroy, Memphis, Tenn.; Richard A. Barr, Nashville, Tenn., and Robert L. Sanders, Memphis, Tenn.

The Chairman appointed the following as a Nominating Committee: Drs. F. Webb Griffith, Asheville, N. C.; Isidore Cohn, New Orleans, La., and Jere L. Crook, Jackson, Tenn.

Dr. Earle Drennen, Birmingham, Ala., read a paper entitled "Enterostomy" (with lantern slides), which was discussed by Drs. Edward T. Newell, Chattanooga, Tenn.; J. Wesley Long, Greensboro, N. C., and J. Shelton Horsley, Richmond, Va.

Section adjourned until 9:30 a. m. Thursday.

Thursday, November 16, 9:30 a. m.

The Section was called to order by the Vice-Chairman.

Dr. Vilray P. Blair, St. Louis, Mo., read a paper entitled "Restoration of the Burnt Child," which was discussed by Drs. J. Shelton Horsley, Richmond, Va.; Frank K. Boland, Atlanta, Ga.; Joseph E. Johnson, Memphis, Tenn.; Hermann B. Gessner, New Orleans, La., and in closing by the essayist.

Dr. E. Dunbar Newell, Chattanooga, Tenn., read a paper entitled "Our Conclusions After Six Years' Use of Radium," which was discussed by Dr. W. S. Anderson, Memphis, Tenn., and in closing by the essayist.

Dr. A. W. Ralls, Gadsden, Ala., read a paper entitled "Defense of the Lane Bone Plate in Selected Cases," which was discussed by Drs. Frank K. Boland, Atlanta, Ga.; Isidore Cohn, New Orleans, La.; James K. Simpson, Jacksonville, Fla.; W. B. Burns, Memphis, Tenn., and in closing by the essayist.

Dr. T. W. Holmes, Winona, Miss., read a paper entitled "Intestinal Obstruction," which was discussed by Drs. E. T. Newsom, Sheffield, Ala.; J. Wesley Long, Greensboro, N. C.; W. B. Burns, Memphis, Tenn.; Robert L. Sanders, Memphis, Tenn., and in closing by the essayist.

Dr. Samuel O. Black, Spartanburg, S. C., read a paper entitled "Torsion of the Appendices Epiploicae, with Report of a Case."

Dr. J. Knox Simpson, Jacksonville, Fla., read a paper entitled "Retroperitoneal Pelvic Cysts with Report of a Case," which was discussed by Dr. Frank K. Boland, Atlanta, Ga.

Dr. A. C. Scott, Temple, Tex., read a paper entitled "Eradication of Malignant Disease by Wide Excision and Glandular Dissection with White and Red Hot Cautery," which was discussed by Dr. Robert L. Sanders, Memphis, Tenn.

Dr. Jere L. Crook presented the following report for the Nominating Committee, these nominees being unanimously elected:

For Chairman: Dr. Irvin Abell, Louisville, Ky.
For Vice-Chairman: Dr. Frank K. Boland, Atlanta, Ga.
For Secretary: Dr. J. W. Barksdale, Winona, Miss.

Dr. Abell: "It is needless for me to attempt to thank you for the honor you have shown me. I think it is a great honor to be allowed to preside over a group of men that represents the flower of the surgeons of the South. It will be my earnest effort to carry on the work of the excellent men who have preceded me."

Dr. J. Wesley Long moved that a vote of thanks be extended by the Section on Surgery to the First Baptist Church for the hospitality of its members and for the privilege of using the church. Motion unanimously carried.

Dr. Isidore Cohn moved a vote of thanks to the officers of the Section for the splendid series of papers which they had given the members of the Section an opportunity to listen to. Motion unanimously carried by rising vote.

The Section then adjourned sine die.

SOUTHERN STATES ASSOCIATION OF RAILWAY SURGEONS

Auxiliary of Southern Medical Association

Officers

President—Dr. Lucius E. Burch, Nashville, Tenn.
Vice-President—Dr. W. W. Harper, Selma, Ala.
Secretary—Dr. J. W. Palmer, Ailey, Ga.

Monday, November 13, 9:30 a. m.

The Association met in the First Baptist Church, Chattanooga, Tenn., and was called to order by the President.

The President called attention to a meeting of the Railway Surgeons of Tennessee for the purpose of organizing a State Association of Railway Surgeons.

At the suggestion of Dr. Duncan Eve, Sr., the privileges of the floor were extended to Dr. G. G. Dowdall, Chief Surgeon of the Illinois Central Railroad, and any other visiting surgeons who were present.

Dr. J. M. Clack, Rockwood, Tenn., read a paper entitled "Diagnosis in Acute Abdominal Conditions," which was discussed by Drs. W. W. Harper, Selma, Ala.; C. Holtzclaw, Chattanooga, Tenn.; J. S. Turberville, Century, Fla.; Archibald E. Chace, Texarkana, Ark.; T. H. Hancock, Atlanta, Ga.; Jere L. Crook, Jackson, Tenn.; W. S. Anderson, Memphis, Tenn.; Lucius E. Burch, Nashville, Tenn.; C. N. Cowden, Nashville, Tenn.; Samuel M. Scott, Oakdale, La., and in closing by the essayist.

Dr. H. T. Ballantine, Muskogee, Okla., read a paper entitled "Service—With Loyalty," which was discussed by Drs. Duncan Eve, Nashville, Tenn.; L. M. Anderson, Lake City, Fla.; J. A. Mitchell, Tullahoma, Tenn.; C. Holtzclaw, Chattanooga, Tenn.; E. T. Newsom, Sheffield, Ala.; G. G. Dowdall, Chicago, Ill.; Wm. P. McDonald, Spring City, Tenn., and in closing by the essayist.

Mr. Whitefoord R. Cole, President, Nashville, Chattanooga and St. Louis Railway, Nashville, Tenn., addressed the Association on matters of general interest.

Dr. J. S. Turberville, Century, Fla., moved a rising vote of thanks to Mr. Cole for his courtesy in addressing the Association and for the hope he had given in regard to foreign transportation. Motion unanimously carried.

The Association adjourned until 2:00 p. m.

Monday, November 13, 2:00 p. m.

The Association was called to order by the President.

Dr. F. Walter Carruthers, Little Rock, Ark., read a paper entitled "The So-Called Railway Spine," which was discussed by Drs. W. W. Harper, Selma, Ala., and Theodore Toepel, Atlanta, Ga.

Dr. Duncan Eve, Sr., Nashville, Tenn., read a paper entitled "Fractures of the Neck of the Hip."

Dr. Edward T. Newell, Chattanooga, Tenn., read a paper entitled "Treatment of Fracture, With Special Reference to Fracture of the Femur" (with lantern slides).

Dr. J. N. Baker, Montgomery, Ala., presented a paper entitled "Fractures of the Upper End of the Humerus." (Paper was read by Dr. Thomas H. Hubbard in the absence of Dr. Baker.)

Papers of Dr. Eve, Dr. Newell and Dr. Baker were discussed by Drs. J. M. Burke, Petersburg, Va.; Archibald E. Chace, Texarkana, Ark.; Hermann B. Gessner, New Orleans, La.; William P. Bradburn, New Orleans, La.; James R. Garner, Atlanta, Ga.; William Beall Carrell, Dallas, Tex.; Theodore Toepel, Atlanta, Ga.; W. W. Harper, Selma, Ala.; E. Dunbar Newell, Chattanooga, Tenn.; William B. Owen, Louisville, Ky., and in closing by Dr. Eve and Dr. Newell.

Dr. Lucius E. Burch, Nashville, Tenn., read his Chairman's Address entitled "The Railway Surgeon—Past, Present and Future."

Dr. J. W. Palmer, Ailey, Ga., the Secretary, reported that he was present at the meeting of the Association of Railway Executives as a representative of this Association. He had prepared his remarks to present them to the executives of the railroads, but when he reached the meeting he found that the executives were all in conference at Washington and his audience consisted of chief surgeons. He thought the chief surgeons were willing to hear his remarks and to grant the things he asked for, with a few exceptions.

He had hoped that, although the executives were not present at the meeting, his remarks would be printed in the minutes and reach the executives in that way, but a recent letter from the Secretary of the Association of Railway Executives had informed him that the President did not consider his remarks subject for publication and had decided to leave them out of the minutes.

The Association of Railway Executives had recognized the railway surgeons to the extent of organizing a medical and surgical section and each society is entitled to two delegates. These delegates are entitled to see and hear and listen, but cannot vote. He believed that some progress was being made and that what was being accomplished was worth while. He did not blame the chief surgeons for not wanting to talk about foreign transportation.

The Association was interested in three things, viz: foreign transportation, graded fee system, and support of the surgical department, without any connection with the legal department. He felt sure that the chief surgeons were friendly and would gladly give the Association anything it wanted, if it were within their power. The thing to do was to strike higher up, the railway officials and executives.

He believed before railroads would ever recognize the power of the railway surgeon it would be necessary to have a separate organization in every state. If this could be accomplished and the fifteen thousand railway surgeons in the Country could meet annually and discuss their needs they would be recognized as a force. He urged that all railway surgeons who came from states where there was no state organization should go home and organize a state society without delay and adopt some official organ for publication of the proceedings of the society.

It was hoped that by October, 1923 every state would have such an organization. When that was accomplished they would have a permanent organization that would cause the railroads to realize that the local surgeons represent the intelligence and force of their communities and that they were the best assets the roads have.

The Secretary, Dr. Palmer, then read a letter from the Secretary of the Association of Railway Executives.

The President, Dr. Burch, said that Mr. Cole, President of the Nashville, Chattanooga and St. Louis Railway, thought that there was no reason why local surgeons should not receive foreign transportation, providing they were going on railroad business.

After some discussion of the matter, Dr. Duncan Eve moved that it be the sense of the Association that it respectfully favored transportation for railway surgeons and that the President and Secretary transmit this information to the officials of the Association of Railway Executives. Motion carried.

The Association proceeded to the election of officers with the following result:

President: Dr. W. W. Harper, Selma, Ala
Vice-President: Dr. S. S. Gale, Roanoke, Va.
Secretary: Dr. J. W. Palmer, Ailey, Ga.
Representatives to the A. of R. A.: Dr. T. C. Thompson, Vidalia, Ga., and Dr. T. H. Hancock, Atlanta, Ga.

Dr. Burch requested Dr. Garner to escort the newly elected President to the Chair. In a few well chosen words, Dr. Harper expressed his appreciation of his election.

The Association then adjourned sine die.

CONFERENCE OF CHIEF SURGEONS

Auxiliary of Southern States Association of Railway Surgeons

Officers

Chairman—Dr. Joseph M. Burke, Petersburg, Va.
Secretary—Dr. J. W. Palmer, Ailey, Ga.

The Conference was called to order by the Chairman.

The Chairman asked if there were any special matters to be considered. There was some discussion of the question of foreign transportation. Dr. Harper introduced the subject of the title of "Local Surgeon" and expressed the opinion that it would add to the dignity of the railway surgeons if they were all designated as "Company Surgeons."

Dr. G. G. Dowdall, Chief Surgeon of the Illinois Central Railroad, stated they were designated as Division, District and Local Surgeons on his line, but that there would be no objection on the part of the Chief Surgeon or any one to having all railway surgeons designate themselves as "Company Surgeons." Dr. Burke thought all Chief Surgeons were agreed on this.

There being nothing further to be considered at this time, the Conference adjourned.

SECTION ON UROLOGY

Officers

Chairman—Dr. E. G. Ballenger, Atlanta, Ga.
Vice-Chairman—Dr. H. W. E. Walther, New Orleans, La.
Secretary—Dr. J. C. Vinson, Tampa, Fla.

Tuesday, November 14, 2:00 p. m.

The Section met in the First Christian Church, Chattanooga, Tenn., and was called to order by the Chairman, Dr. E. G. Ballenger, Atlanta, Ga., who read his Chairman's Address entitled "A Study of Colloids."

Drs. John T. Geraghty and William A. Frontz, Baltimore, Md., presented a paper entitled "Nephralgia," which was discussed by Drs. Montague L. Boyd, Atlanta, Ga.; H. W. E. Walther, New Orleans, La.; W. J. Wallace, Oklahoma City, Okla.; Irving Simons, Nashville, Tenn.; Paul G. Morrissey, Nashville, Tenn.; J. H. Smith, Memphis, Tenn.; Stratton E. Kernodle, Oklahoma City, Okla., and in closing by Dr. Geraghty.

Dr. Montague L. Boyd, Atlanta, Ga., read a paper entitled "Prostatectomy."

Dr. George R. Livermore, Memphis, Tenn., read a paper entitled "Some Disputed Points in Suprapubic Prostatectomy."

Papers of Dr. Boyd and Dr. Livermore were discussed by Drs. H. W. E. Walther, New Orleans, La.; Hamilton W. McKay, Charlotte, N. C.; Abraham Nelken, New Orleans, La.; Jerome L. Morgan, Memphis, Tenn.; Paul Gelpi, New Orleans, La.; Arthur L. Chute, Boston, Mass.; J. Shelton Horsley, Richmond, Va., and in closing by the essayists.

Drs. W. W. Duke and D. D. Stofer, Kansas City, Mo., presented a paper entitled "Food Allergy as a Cause of Irritable Bladder," which was discussed by Drs. John T. Geraghty, Baltimore, Md.; Edgar G. Ballenger, Atlanta, Ga.; Arthur L. Chute, Boston, Mass.; James T. Wolfe, Washington, D. C., and in closing by Dr. Duke.

Drs. Hamilton W. McKay and Lester C. Todd, Charlotte, N. C., presented a paper entitled "Comparative Study of Neisserian Infections in the Male and Female Urethrae" (with lantern slides), which was discussed by Drs. Milton Weinberg, Sumter, S. C.; Montague L. Boyd, Atlanta, Ga.; W. J. Wallace, Oklahoma City, Okla.; H. W. E. Walther, New Orleans, La.; Paul G. Morrissey, Nashville, Tenn.; T. S. Field, Jacksonville, Fla.; Paul Gelpi, New Orleans, La.; Harry Young Righton, Savannah, Ga., and in closing by Dr. McKay.

Section adjourned until 2:00 p. m. Wednesday.

Wednesday, November 15, 2:00 p. m.

The Section was called to order by the Vice-Chairman.

Dr. Arthur L. Chute, Boston, Mass., read a paper entitled "Post-Operative Care of Urinary Cases" (with lantern slides), which was discussed by Drs. Edgar G. Ballenger, Atlanta, Ga.; John T. Geraghty, Baltimore, Md.; Abraham Nelken, New Orleans, La.; George R. Livermore, Memphis, Tenn.; William F. Braasch, Rochester, Minn.; H. W. E. Walther, New Orleans, La., and in closing by the essayist.

The Chairman then took the Chair, and appointed the following as a Nominating Committee: Drs. George R. Livermore, Memphis, Tenn.; Carl A. Wheeler, Lexington, Ky., and J. H. Smith, Memphis, Tenn.

Dr. William F. Braasch, Rochester, Minn., read a paper entitled "Recent Developments in the Treatment of Renal Lithiasis" (with lantern slides).

Dr. Robert C. Bryan, Richmond, Va., read a paper entitled "Diagnosis of Stone in the Ureter" (with lantern slides).

Papers of Dr. Braasch and Dr. Bryan were discussed by Drs. Robert C. Bryan, Richmond, Va.; Irving Simons, Nashville, Tenn.; George R. Livermore, Memphis, Tenn.; Alfred L. Gray, Richmond, Va.; R. B. McIver, Jacksonville, Fla., and in closing by Dr. Braasch.

Dr. Walter C. Jones, Birmingham, Ala., read a paper entitled "Experimental Intraperitoneal Division of One Ureter" (with lantern slides), which was discussed by Drs. L. F. Turlington, Birmingham, Ala.; M. Y. Dabney, Birmingham, Ala., and in closing by the essayist.

Drs. Charles J. Waters and J. W. Pierson, Baltimore, Md., presented a paper entitled "Some Observations on Deep X-Ray Therapy in the Relief of Metastatic Pain in Prostatic Carcinoma," which was discussed by Drs. John T. Geraghty, Baltimore, Md.; H. W. E. Walther, New Orleans, La., and in closing by Dr. Waters.

Dr. Paul J. Gelpi, New Orleans, La., read a paper entitled "Report of a Case of Prostatic Tumor Treated with Deep X-Ray Therapy," which was discussed by Dr. Abraham Nelken, New Orleans, La., and in closing by the essayist.

Dr. George R. Livermore presented the following report for the Nominating Committee, these nominees being unanimously elected:

For Chairman: Dr. H. W. E. Walther, New Orleans, La.
For Vice-Chairman: Dr. A. I. Folsom, Dallas, Tex.
For Secretary: Dr. J. C. Vinson, Tampa, Fla.

The Shoreham Hotel, Washington, was suggested as headquarters for the Section on Urology for next year's meeting. It was also decided that a Section dinner should be given on some suitable evening, the Secretary to arrange details with the Association office.

Dr. Livermore moved that a vote of thanks be extended by the Section on Urology to the First Christian Church for the privilege of using the Church. Motion unanimously carried.

Dr. Geraghty moved that a rising vote of thanks be given the officers of the Section for the excellent program they had furnished and for the courtesy extended those taking part in the program and discussions. Motion unanimously carried.

The Section then adjourned sine die.

SECTION ON BONE AND JOINT SURGERY

(Formerly Section on Orthopedic Surgery)

Officers

Chairman—Dr. W. Barnett Owen, Louisville, Ky.
Vice-Chairman—Dr. Willis Campbell, Memphis, Tenn.
Secretary—Dr. Fred G. Hodgson, Atlanta, Ga.

Tuesday, November 14, 2:00 p. m.

The Section met in the First Baptist Church, Chattanooga, Tenn., and was called to order by the Chairman, Dr. W. Barnett Owen, Louisville, Ky., who read his Chairman's Address entitled "The Future of Orthopedic Surgery in the South."

Dr. E. G. Brackett, Boston, Mass., read a paper entitled "The Application of the Principles of Treatment of Joint Tuberculosis" (with lantern slides), which was discussed by Drs. G. E. Bennett, Baltimore, Md.; Frank D. Dickson, Kansas City, Mo.; Willis C. Campbell, Memphis, Tenn.; E. Laurence Scott, Birmingham, Ala.; F. W. Carruthers, Little Rock, Ark.; Wyatt S. Roberts, Birmingham, Ala.; J. K. Simpson, Jacksonville, Fla., and in closing by the essayist.

Dr. R. W. Billington, Nashville, Tenn., read a paper entitled "Low Back Pains," which was discussed by Drs. E. Laurence Scott, Birmingham, Ala.; E. G. Brackett, Boston, Mass.; G. E. Bennett, Baltimore, Md.; F. W. Carruthers, Little Rock, Ark.; Robert F. Patterson, Knoxville, Tenn.; Theodore Toepel, Atlanta, Ga., and in closing by the essayist.

Dr. Willis C. Campbell, Memphis, Tenn., read a paper entitled "Operation for Flexion Contracture of the Hip" (with lantern slides), which was discussed by Drs. F. W. Carruthers, Little Rock, Ark.; G. E. Bennett, Baltimore, Md.; Lawson Thornton, Atlanta, Ga.; W. B. Carroll, Dallas, Tex., and in closing by the essayist.

Dr. Frank D. Dickson, Kansas City, Mo., read a paper entitled "Arthroplasty" (with motion pictures), which was discussed by Drs. R. T. Taylor, Baltimore, Md.; G. E. Bennett, Baltimore, Md.; Willis C. Campbell, Memphis, Tenn., and in closing by the essayist.

Dr. F. W. Carruthers, Little Rock, Ark., read a paper entitled "So-Called Perthe's Disease," which was discussed by Drs. E. G. Brackett, Boston, Mass.; Frank D. Dickson, Kansas City, Mo.; W. B. Carroll, Dallas, Tex.; E. Laurence Scott, Birmingham, Ala., and in closing by the essayist.

The Section adjourned until 2:00 p. m. Wednesday.

Wednesday, November 15, 2:00 p. m.

The Section was called to order by the Chairman.

Dr. G. E. Bennett, Baltimore, Md., showed some lantern slides illustrating his subject, "Utilization of the Head of the Fibula for the External Malleolus," which was discussed by Drs. R. W. Billington, Nashville, Tenn.; B. A. Washburn, Paducah, Ky.; Willis C. Campbell, Memphis, Tenn.; E. G. Brackett, Boston, Mass., and in closing by the essayist.

Dr. Wyatt S. Roberts, Birmingham, Ala., read a paper entitled "Tendon Transplantations," which was discussed by Drs. G. E. Bennett, Baltimore, Md.; A. G. Nichol, Nashville, Tenn.; Lawson Thornton, Atlanta, Ga.; E. Laurence Scott, Birmingham, Ala.; Fred G. Hodgson, Atlanta, Ga.; E. G. Brackett, Boston, Mass., and in closing by the essayist.

Dr. E. Laurence Scott, Birmingham, Ala., demonstrated a simple brace for cases of pronated foot and dropped foot, which was discussed by Drs. E. G. Brackett, Boston, Mass.; Wyatt S. Roberts, Birmingham, Ala., and in closing by Dr. Scott.

Dr. B. A. Washburn, Paducah, Ky., read a paper entitled "Unnecessary Operations Above the Elbow" (with lantern slides), which was discussed by Drs. W. Barnett Owen, Louisville, Ky.; R. W. Billington, Nashville, Tenn.; E. Laurence Scott, Birmingham, Ala., and in closing by the essayist.

Dr. Lawson Thornton, Atlanta, Ga., demonstrated an appliance for use in flexion of the knee, which was discussed by Dr. Fred G. Hodgson, Atlanta, Ga.

Dr. E. Laurence Scott, Birmingham, Ala., mentioned tightness of the psoas parvus muscle as a possible cause of backache.

The Chairman announced the appointment of the following Nominating Committee: Drs. W. B. Carroll, Dallas, Tex.; G. E. Bennett, Baltimore, Md., and Wyatt S. Roberts, Birmingham, Ala.

It was moved and carried that the name of the Section be changed to Section on Bone and Joint Surgery, and that the incoming officers constitute a committee to take up with the Council the matter of the change of name.

The Nominating Committee presented the following report, the nominees being unanimously elected:

For Chairman: Dr. Willis C. Campbell, Memphis, Tenn.
For Vice-Chairman: Dr. Fred G. Hodgson, Atlanta, Ga.
For Secretary: Dr. E. Laurence Scott, Birmingham, Ala.

The Section adjourned sine die.

SECTION ON OBSTETRICS

Officers

Chairman—Dr. Calvin R. Hannah, Dallas, Tex.
Vice-Chairman—Dr. J. T. Altman, Nashville, Tenn.
Secretary—Dr. James R. Garber, Birmingham, Ala.

Monday, November 13, 2:00 p. m.

The Section met in the Stone Church, Chattanooga, Tenn., and was called to order by the Chairman, Dr. Calvin R. Hannah, Dallas, Tex., who read his Chairman's Address entitled "The Training of an Obstetrician."

Dr. Ralph H. Pomeroy, Brooklyn, N. Y., read a paper entitled "Median Perineotomy—Indications, Technique and Valuation," which was discussed by Drs. Erasmus H. Kloman, Baltimore, Md.; George Clark Mosher, Kansas City, Mo.; Walter E. Levy, New Orleans, La.; Edward Speidel, Louisville, Ky.; Burnley Lankford, Norfolk, Va.; George F. Wilson, Charleston, S. C.; Basil M. Taylor, Greensburg, Ky., and in closing by the essayist.

Dr. Erasmus H. Kloman, Baltimore, Md., read a paper entitled "Pyelitis in Pregnancy," which was discussed by Drs. H. W. E. Walther, New Orleans, La.; Thomas B. Sellers, New Orleans, La.; Thomas B. Hubbard, Montgomery, Ala.; E. T. Newsom, Sheffield, Ala.; J. George Dempsey, New Orleans, La.; Basil M. Taylor, Greensburg, Ky.; H. A. Davidson, Louisville, Ky., and in closing by the essayist.

Dr. William T. McConnell, Louisville, Ky., read a paper entitled "The Trained Nurse in Obstetrics," which was discussed by Drs. Edward Speidel, Louisville, Ky.; George Clark Mosher, Kansas City, Mo.; H. A. Davidson, Louisville, Ky.; James R. Garber, Birmingham, Ala.; Ralph H. Pomeroy, Brooklyn, N. Y.; J. George Dempsey, New Orleans, La.; Burnley Lankford, Norfolk, Va.; Walter E. Levy, New Orleans, La.; George F. Wilson, Charleston, S. C.; Basil M. Taylor, Greensburg, Ky., and in closing by the essayist.

The Chairman read a telegram from Dr. Marion T. Benson, of Atlanta, stating his inability to be present on account of illness.

Dr. James R. Garber, Birmingham, Ala., read a paper entitled "What a Daughter Should Know."

The Section adjourned until 2:00 p. m. Tuesday.

Tuesday, November 14, 2:00 p. m.

The Section was called to order by the Chairman.

Dr. Francis Reder, St. Louis, Mo., read a paper entitled "The Uterus in Malposition," which was discussed by Drs. T. S. Field, Jacksonville, Fla.; Edward Spiedel, Louisville, Ky.; E. T. Newsom, Sheffield, Ala.; George Clark Mosher, Kansas City, Mo., and in closing by the essayist.

Dr. Thomas B. Sellers, New Orleans, La., read a paper entitled "Prepartum Care, with Special Reference to the Value of an Early Diagnosis and Treatment of Certain Complications,' which was discussed by Drs. J. C. Brooks, Chattanooga, Tenn.; Walter E. Levy, New Orleans, La.; George F. Wilson, Charleston, S. C.; Wm. T. McConnell, Louisville, Ky.; George Clark Mosher, Kansas City, Mo.; J. George Dempsey, New Orleans, La.; W. G. Bogart, Chattanooga, Tenn.; George F. Pendleton, Kansas City, Mo., and in closing by the essayist.

Dr. George Clark Mosher, Kansas City, Mo., read a paper entitled "Purpura Haemorrhagica in Pregnancy," which was discussed by Dr. Edward Speidel, Louisville, Ky., and in closing by the essayist.

Dr. M. H. Newman, Oklahoma City, Okla., read a paper entitled "Eclampsia: Etiology and Treatment."

Dr. Burnley Lankford, Norfolk, Va., read a paper entitled "The Value of Rectal Examination in Obstetrics."

Papers of Dr. Newman and Dr. Lankford were discussed by Drs. Erasmus H. Kloman, Baltimore, Md.; Francis Reder, St. Louis, Mo.; George F. Wilson, Charleston, S. C.; Thomas B. Sellers, New Orleans, La.; John M. Clack, Rockwood, Tenn.; George Clark Mosher, Kansas City, Mo., and in closing by the essayists.

The Chairman appointed the following as a Nominating Committee: Dr. George Clark Mosher, Kansas City, Mo.; Dr. Burnley Lankford, Norfolk, Va., and Dr. H. E. Mitchell, Birmingham, Ala.

The Section adjourned until 2:00 p. m. Wednesday.

Wednesday, November 15, 2:00 p. m.

The Section was called to order by the Chairman.

The Nominating Committee made the following report, the nominees being unanimously elected:

For Chairman: Dr. John T. Altman, Nashville, Tenn.
For Vice-Chairman: Dr. Edward Speidel, Louisville, Ky.
For Secretary: Dr. James R. Garber, Birmingham, Ala.

The Secretary, Dr. James R. Garber, offered the following resolution:

"Whereas, The Section on Obstetrics of the Southern Medical Association was organized for the performance and advancement of constructive and progressive principles; and,

"Whereas, The Section accepts the opportunity of being of service to the general public within its territory; and,

"Whereas, The Section recognizes the great necessity of providing the necessary and efficient nursing facilities for maternity work; and,

"Whereas, It is the general opinion of those in session at this meeting of the Section that the question of proper nursing of maternity cases constitutes an urgent, serious and mandatory problem for solution; therefore, be it

"Resolved by the Section on Obstetrics of the Southern Medical Association:

"(1) That it deplores the present attitude of the trained nurse toward obstetrical work;

"(2) That a committee be appointed by the Chairman of this Section to devise and study plans and make recommendations for an adjustment of this problem; and

(3) That this committee present its recommendations to the Section at the next annual meeting."

It was moved and carried that this resolution be adopted.

Dr. George Clark Mosher then offered the following resolution:

"Since statistics reveal the melancholy fact that morbidity and mortality have increased in obstetrics in the past twenty years, and since the only method of reducing this startling record is by education, it is proposed that we appoint a committee on Maternal Welfare as a standing committee of the Section on Obstetrics of the Southern Medical Association.

"This committee should endeavor to educate, first, the medical profession of the South; second, the nurses; and third, the laity as to the methods which will change conditions of maternity in the United States from its unenviable position as fourteenth among civilized nations of the world to the first rank, where our boasted intelligence, humanity and efficiency should place our Country.

"It is proposed:

"1. To institute a propaganda among doctors giving the facts as to our maternal and infant death rate.

"2. To keep continually before the profession the simple principles of the prenatal care, asepsis and puerperal supervision.

"3. To provide some adequate method of increasing the nursing corps of the South to take the burden off the shoulders of the great middle class of wage earners who cannot afford the expense necessary in employing the graduate nurse.

"To provide nursing for those of the poor who cannot reach hospital facilities, but who must depend on non-professional care.

"To include in our campaign of education the subjects of:

"1. Sepsis.

"2. Eclampsia. (These two claiming the greatest number of victims.)

"3. Abortion, which destroys hundreds of thousands of potential lives before they are born. This is a crying need for our efforts.

"4. The venereal diseases and their effect on health and life of both mother and child.

"5. We should cooperate with the American Child Hygiene Association, the American Pediatric Society, the American Association of Obstetricians and Gynecologists and the American Gynecological Society in accomplishing these results, realizing that in such combination the greatest good can be secured."

It was moved and carried that this resolution be adopted.

The Chairman appointed the following as the Committee mentioned in the resolution presented by Dr. Garber: Dr. James R. Garber, Chairman, Birmingham, Ala.; Dr. J. George Dempsey, New Orleans, La., and Dr. Wm. T. McConnell, Louisville, Ky.

Dr. T. S. Field, Jacksonville, Fla., read a paper entitled "A Discussion of the Present Day Obstetrical Procedure," which was discussed by Drs. R. B. Miller, Jacksonville, Fla.; Thomas B. Sellers, New Orleans, La.; James R. Garber, Birmingham, Ala.; W. G. Bogart, Chattanooga, Tenn.;

George F. Pendleton, Kansas City, Mo., and in closing by the essayist.

Dr. R. M. Wilson, Kwangju, Korea, spoke on the "Progress in the Treatment of Leprosy," illustrated with lantern slides.

A case report session was then had, at which a number of interesting cases were presented.

The Section then adjourned sine die.

SECTION ON OPHTHALMOLOGY, RHINOLOGY, OTOLOGY AND LARYNGOLOGY

Officers

Chairman—Dr. H. H. Briggs, Asheville, N. C.
Vice-Chairman—Dr. John H. Foster, Houston, Tex.
Secretary—Dr. John J. Shea, Memphis, Tenn.

Tuesday, November 14, 9:30 a. m.

The Section met in the Criminal Court Room, County Court House, Chattanooga, Tenn., and was called to order by the Chairman.

Dr. G. C. Savage, Nashville, Tenn., presented a phorometer just finished by De Zeng, a monocular instrument capable of measuring any error of any ocular muscle or group of ocular muscles.

Dr. Harold Bailey, Springfield, Mo., presented lens forceps for extracting the lens in case of dislocation; or in case of extraction of immature cataract. One blade is fenestrated. The narrow blade goes behind and the fenestrated blade in front of the lens.

The Chairman appointed the following members as a Nominating Committee: Dr. T. W. Moore, Huntington, W. Va.; Dr. J. B. Greene, Asheville, N. C., and Dr. G. C. Savage, Nashville, Tenn.

Dr. H. H. Briggs, Asheville, N. C., read his Chairman's Address entitled "Tuberculosis of the Larynx," which was discussed by Dr. Charles L. Minor, Asheville, N. C.

Dr. Walter B. Lancaster, Boston, Mass., read a paper entitled "Certain Anatomical and Physiological Considerations Bearing on Heterophoria," which was discussed by Drs. G. C. Savage, Nashville, Tenn.; Tom A. Williams, Washington, D. C., and in closing by the essayist.

Dr. E. C. Ellett, Memphis, Tenn., read a paper entitled "Orbital and Ocular Tumors" (with lantern slides), which was discussed by Drs. Harold Bailey, Springfield, Mo.; E. H. Cary, Dallas, Tex.; Hilliard Wood, Nashville, Tenn.; Adolph O. Pfingst, Louisville, Ky., and in closing by the essayist.

Dr. G. C. Savage, Nashville, Tenn., read a paper entitled "Cataract Extraction from Daviel to Hulen," which was discussed by Drs. E. C. Ellett, Memphis, Tenn.; Walter B. Lancaster, Boston, Mass.; H. C. Ezell, Nashville, Tenn., and in closing by the essayist.

Dr. Clifton M. Miller, Richmond, Va., read a paper entitled "Dermoid of the Conjunctiva, Report of a Case," which was discussed by Dr. Adolph O. Pfingst, Louisville, Ky.

Dr. F. Phinizy Calhoun, Atlanta, Ga., read a paper entitled "Retro-Bulbar Neuritis of Malarial Origin," which was discussed by Drs. J. M. Hogshead, Chattanooga, Tenn.; E. W. Carpenter, Greenville, S. C.; G. C. Savage, Nashville, Tenn., and in closing by the essayist.

The Section adjourned until 9:30 a. m. Wednesday.

Wednesday November 15, 9:30 a. m.

The Section was called to order by the Chairman.

Dr. P. McG. Farrington, Memphis, Tenn., presented a glass for office use behind the head mirror. The reading glass is below, with 75 added to the reading glass for close work above.

Dr. John H. Burleson, San Antonio, Tex., read a paper entitled "Some Clinical Observations Following the Use of Cyanide of Mercury in Lenticular Opacities," which was discussed by Drs. Wallace Ralston, Houston, Tex.; G. C. Savage, Nashville, Tenn.; O. H. King, Hot Springs, Ark.; Walter B. Lancaster, Boston, Mass., and in closing by the essayist.

Dr. H. M. Taylor, Jacksonville, Fla., read a paper entitled "Some Observations on Aural Conditions Resulting from Pool and Sea Bathing," which was discussed by Drs. W. T. Patton, New Orleans, La.; E. H. Cary, Dallas, Tex.; John H. Foster, Houston, Tex.; Arthur I. Weil, New Orleans, La.; George E. Adkins, Jackson, Miss.; Benjamin F. Hodson, Miami, Fla.; Joseph B. Farrier, Tampa, Fla.; C. L. Kibler, Columbia, S. C.; P. McG. Farrington, Memphis, Tenn., and in closing by the essayist.

It was moved by Dr. W. T. Patton, New Orleans, La., that a committee of three be appointed by the Chairman to look into this matter and report to this Section next year. Motion carried. The Chairman appointed the following Committee: Dr. H. M. Taylor, Jacksonville, Fla.; Dr. W. T. Patton, New Orleans, La.; Dr. George E. Adkins, Jackson, Miss.

Dr. Robert Caldwell, Little Rock, Ark., read a paper entitled "Routine Procedure in Eye Ball Affections," which was discussed by Drs. E. H. Cary, Dallas, Tex.; D. D. McHenry, Oklahoma City, Okla.; M. F. Arbuckle, St. Louis, Mo., and in closing by the essayist.

Dr. Joseph D. Heitger, Louisville, Ky., read a paper entitled "Some Observations of Eye Lesions of Nasal Origin," which was discussed by Drs. W. T. Patton, New Orleans, La.; Harold Bailey, Springfield, Mo.; Arthur I. Weil, New Orleans, La.; M. F. Arbuckle, St. Louis, Mo.; E. H. Cary, Dallas, Tex.; John J. Shea, Memphis, Tenn.; Hugh M. Lokey, Atlanta, Ga., and in closing by the essayist.

Dr. J. F. Townsend, Charleston, S. C., read a paper entitled "The Vaccine Treatment of Vernal Conjunctivitis," which was discussed by Drs. K. W. Constantine, Birmingham, Ala.; F. Phinizy Calhoun, Atlanta, Ga.; W. E. Driver, Norfolk, Va., and in closing by the essayist.

Dr. Edward A. Looper, Baltimore, Md., read a paper entitled "The Problem of Obscure Nose and Throat Affections," which was discussed by Drs. W. E. Driver, Norfolk, Va.; J. M. Lea, Knoxville, Tenn.; Homer J. Dupuy, New Orleans, La.; M. M. Stapler, Macon, Ga.; F. E. Hasty, Nashville, Tenn., and in closing by the essayist.

The Section adjourned until 9:30 a. m. Thursday.

Thursday, November 16, 9:30 a. m.

The Section was called to order by the Chairman.

Dr. Elbyrne G. Gill, Roanoke, Va., read a paper entitled "Brain Abscess Complicating Acute Mastoiditis; Operation, Recovery," which was discussed by Drs. Homer J. Dupuy, New Orleans, La.: J. F. Townsend, Charleston, S. C.; F. E. Hasty, Nashville, Tenn., and in closing by the essayist.

Dr. E. W. Carpenter, Greenville, S. C., read a paper entitled "A Review of Thirty-two Cases of Endoscopy of Foreign Bodies," which was discussed by Drs. J. F. Townsend, Charleston, S. C.; H. M. Taylor, Jacksonville, Fla.; Clyde E. Purcell, Paducah, Ky.; W. Likely Simpson, Memphis, Tenn.; M. F. Arbuckle, St. Louis, Mo.; A. E. Goodloe, Chattanooga, Tenn., and in closing by the essayist.

Dr. Clyde E. Purcell, Paducah, Ky., read a paper entitled "Direct Intubation and Bronchoscopy in Neglected and Desperate Cases of Tracheal and Bronchial Diphtheria," which was discussed by Drs. A. E. Goodloe, Chattanooga, Tenn.; Homer J. Dupuy, New Orleans, La.; M. F. Arbuckle, St. Louis, Mo., and in closing by the essayist.

Dr. Joseph B. Greene, Asheville, N. C., read a paper entitled "Acute Otitis Media in Children," which was discussed by Drs. John H. Foster, Houston, Tex.; Homer J. Dupuy, New Orleans, La.; Clifton B. Miller, Richmond, Va.; M. F. Arbuckle, St. Louis, Mo.; Joseph D. Heitger, Louisville, Ky.; Harold Bailey, Springfield, Mo., and in closing by the essayist.

Dr. F. E. Hasty, Nashville, Tenn., read a paper entitled "The Technique of a Radical Mastoid," which was discussed by Drs. John J. Shea, Memphis, Tenn.; W. T. Patton, New Orleans, La.; J. F. Townsend, Charleston, S. C., and in closing by the essayist.

Dr. W. W. Potter, Knoxville, Tenn., read a paper entitled "More Conservatism in Nasal Surgery," which was discussed by Drs. W. T. Patton, New Orleans, La.; John J. Shea, Memphis, Tenn., and Robert W. Bledsoe, Covington, Ky.

The Nominating Committee reported as follows, the nominees being unanimously elected:

For Chairman: Dr. J. H. Foster, Houston, Tex.
For Vice-Chairman: Dr. John J. Shea, Memphis, Tenn.
For Secretary: Dr. H. M. Taylor, Jacksonville, Fla.

The new Chairman, Dr. John H. Foster, was escorted to the platform. The retiring Chairman, Dr. H. H. Briggs, expressed his appreciation of the cooperation of the members through the past year.

The Section then adjourned sine die.

SECTION ON PUBLIC HEALTH

Officers

Chairman—Dr. Ennion G. Williams, Richmond, Va.
Vice-Chairman—Dr. C. W. Garrison, Little Rock, Ark.
Secretary—Dr. Henry Boswell, Sanatorium, Miss.

Tuesday, November 14, 9:30 a. m.

The Section met in the First Christian Church, Chattanooga, Tenn., and was called to order by the Chairman.

The session was opened with prayer by Dr. Hill, Pastor of the First Christian Church.

Dr. Ennion G. Williams, State Health Officer, Richmond, Va., read his Chairman's Address entitled "Our Southern Problem."

Dr. W. F. Draper, Assistant Surgeon-General, U. S. Public Health Service, Washington, D. C., read a paper entitled "A Program of Rural Health Work," which was discussed by Drs. Ennion G. Williams, Richmond, Va.; A. P. Harrison, Austin, Tex.; James A. Hayne, Columbia, S. C.; W. S. Keister, Charlottesville, Va.; S. W. Welch, Montgomery, Ala.; John A. Ferrell, New York, N. Y., and in closing by the essayist.

Paper of Dr. P. E. Blackerby, Kentucky State Board of Health, Louisville, Ky., entitled "The Relation of the Public Health Nurse to the All-Time Health Department," was read by title.

Dr. Oscar Dowling, State Health Officer, New Orleans, La., read a paper entitled "Public Confidence in the Medical Profession," which was discussed by Drs. W. S. Leathers, Jackson, Miss.; Roy K. Flannagan, Richmond, Va.; K. E. Miller, Raleigh, N. C.; James A. Hayne, Columbia, S. C.; L. B. McBrayer, Sanatorium, N. C., and in closing by the essayist.

Dr. James R. Bean, Bacteriologist, City Board of Health, Birmingham, Ala., read a paper entitled "The Limitations of Laboratory Examination," which was discussed by Dr. William Litterer, Nashville, Tenn., and in closing by the essayist.

Dr. W. L. Holt, State Board of Health, Little Rock, Ark., read a paper entitled "Summary of Dengue Research, October to November 13th."

The Section adjourned until 9:30 a. m. Wednesday.

Wednesday, November 15, 9:30 a. m.

The Section was called to order by the Chairman.

Dr. Wm. Litterer, Nashville, Tenn., read a paper entitled "Virulent Diphtheria Bacilli Isolated from Chickens Suffering from Roup," which was discussed by Drs. W. S. Leathers, Jackson, Miss.; C. C. Bass, New Orleans, La.; Wm. Krauss, Memphis, Tenn.; James A. Hayne, Columbia, S. C., and in closing by the essayist.

Paper of Dr. J. H. Florence, State Health Officer, Austin, Tex., entitled "Ten Minutes with Vital Statistics," was read by title.

Dr. Eugene Lyman Fisk, Life Extension Institute, New York, N. Y., read a paper entitled "Extending the Health Span and Life Span After Forty," which was discussed by Drs. Roy K. Flannagan, Richmond, Va.; James A. Hayne, Columbia, S. C.; Robert L. Jones, Nashville, Tenn., and in closing by the essayist.

Dr. W. S. Leathers, State Health Officer, Jackson, Miss., read a paper entitled "Relation of the Public Health Department to the Practicing Physician," which was discussed by Drs. R. Q. Lillard, Lebanon, Tenn.; Hugo Muench, Jr., Shreveport, La.; C. L. Minor, Asheville, N. C.; W. S. Keister, Charlottesville, Va., and in closing by the essayist.

Dr. J. C. Geiger, Epidemiologist, U. S. Public Health Service, Associate Professor of Epidemiology, University of Chicago, Chicago, Ill., read a paper entitled "Clinical Aspects of Botulism—Symptomatology, Pathology, and Rational Treatment" (with lantern slides).

Dr. S. W. Welch, State Health Officer, Montgomery, Ala. read a paper entitled "Venereal Disease Control in Alabama," which was discussed by Dr. Milton Board, Louisville, Ky., and in closing by the essayist.

The Section adjourned until 9:00 a. m. Thursday.

Thursday, November 16, 9:30 a. m.

The Section was called to order by the Chairman.

Dr. K. E. Miller, State Board of Health, Raleigh, N. C., read a paper entitled "Report of Experience with Cost Equivalent System in Its Application to Management of Local Health Work," which was discussed by Drs. W. S. Leathers, Jackson, Miss.; Roy K. Flannagan, Richmond, Va., and in closing by the essayist.

Dr. John Thames, City Health Officer, Little Rock, Ark., read a paper entitled "School Inspection Basic in the Control of Communicable Diseases," which was discussed by Drs. James A. Hayne, Columbia, S. C.; A. H. Hayden, Columbia, S. C.; Roy K. Flannagan, Richmond, Va.; C. C. Applewhite, Jackson, Miss., and in closing by the essayist.

Mr. M. Z. Bair, Sanitary Engineer, State Board of Health, Little Rock, Ark., read a paper entitled "Swimming Pool Sanitation," which was discussed by Dr. F. M. Register, Raleigh, N. C.; Mr. Harry F. Ferguson, Sanitary Engineer, Springfield, Ill.; Dr. James Thames, Little Rock, Ark.; Dr. J. L. Bowman, Montgomery, Ala., and in closing by the essayist.

The Nominating Committee reported as follows, the nominees being unanimously elected:

For Chairman: Dr. Henry Boswell, Sanatorium, Miss.
For Vice-Chairman: Dr. E. B. Wise, Chattanooga, Tenn.
For Secretary: Dr. Roy K. Flannagan, Richmond, Va.

Dr. James A. Hayne, Columbia, S. C., moved that a vote of thanks be given to the First Christian Church for the use of their building and for courtesies shown the Section during its sessions. Motion carried.

The Section then adjourned sine die.

NATIONAL MALARIA COMMITTEE (CONFERENCE ON MALARIA)

Acting as the Malaria Division of the Section on Public Health

Officers of the Committee

Honorary Chairman—Dr. H. R. Carter, U.S.P.H.S., Washington, D. C.
Chairman—Dr. W. S. Leathers, State Health Officer, Jackson, Miss.
Secretary—Dr. L. D. Fricks, Surgeon, U.S.P.H.S., Memphis, Tenn.

Monday, November 13, 10:00 a. m.

The Conference met in the First Christian Church, Chattanooga, Tenn., and was called to order by the Chairman.

Dr. S. W. Welch, State Health Officer, Montgomery, Ala., read a paper entitled "Development of Malaria Control Work on a County-Wide Basis in Alabama," which was discussed by Drs. W. S. Leathers, State Health Officer, Jackson, Miss.; H. R. Carter, Assistant Surgeon-General, U. S. Public Health Service, Washington, D. C.; James A. Hayne, State Health Officer, Columbia, S. C.; Mr. George Parker, International Health Board, Jacksonville, Tex.; Dr. Clinton A. Kane, Director of Malaria Control, Richmond, Va.; Mr. L. M. Fischer, Sanitary Engineer, Columbia, S. C.; Mr. W. G. Stromquist, City Health Department, Memphis, Tenn.; Dr. A. P. Harrison, Austin, Tex., who read resolutions adopted at a recent meeting in Houston, Tex., of the Texas Chamber of Commerce, embodying the plans for malaria control in that State; Drs. Roy K. Flannagan, Assistant State Health Commissioner, Richmond, Va.; S. C. Beach, Illinois Central Railroad, Chicago, Ill.; D. J. Williams, County Health Officer, Gulfport, Miss.; L. D. Fricks, Surgeon, U. S. Public Health Service, Memphis, Tenn.; Wm. Krauss, Memphis, Tenn.; T. H. D. Griffitts, U. S. Public Health Service, Mobile, Ala., and in closing by the essayist.

Dr. L. D. Fricks, Surgeon, U. S. Public Health Service, Memphis, Tenn., introduced Dr. H. R. Carter, Assistant Surgeon-General, U. S. Public Health Service, Washington, D. C., who spoke briefly on "Man-made Malaria."

Dr. Kenneth F. Maxcy, Assistant Surgeon, U. S. Public Health Service, Montgomery, Ala., read a paper entitled "Methods for Determining Malaria Prevalence," which was discussed by Drs. John A. Ferrell, International Health Board, New York, N. Y.; C. C. Bass, New Orleans, La.; Mr. H. F. Ferguson, Springfield, Ill.; Drs. Frederick T. Russell, International Health Board, New York, N. Y.; Victor G. Heiser, International Health Board, New York, N. Y.; M. A. Barber, United States Public Health Service, Brewton, Ala.; Ennion G. Williams, State Health Commissioner, Richmond, Va.; L. D. Fricks, Surgeon, U. S. Public Health Service, Memphis, Tenn.; H. R. Carter, Assistant Surgeon-General, U. S. Public Health Service, Washington, D. C., and in closing by the essayist.

The Conference adjourned until 2:00 p. m.

Monday, November 13, 2:00 p. m.

The Committee was called to order by the Chairman.

The Committee then went into executive session. Minutes of the last meeting held at Hot Springs, Ark., were read

and approved. The reports of the sub-committees, through which the National Malaria Committee functions, were read.

Mr. J. A. LePrince, U. S. Public Health Service, Memphis, Tenn., discussed future activities of the Committee, and in the general discussion which followed the relation which the National Malaria Committee should bear to the properly constituted state and local health authorities were strongly stressed by different members.

The Committee then proceeded to the election of officers to hold until the next regular meeting, with the following results:

Honorary Chairman: Dr. H. R. Carter, Assistant Surgeon-General, U.S.P.H.S., Washington, D. C.
Chairman: Dr. S. W. Welch, State Health Officer, Montgomery, Ala.
Secretary: Dr. L. D. Fricks, Surgeon, U.S.P.H.S., Memphis, Tenn.

The Conference then adjourned sine die.

CONFERENCE OF MALARIA FIELD WORKERS

Meeting Conjointly with Southern Medical Association

A Conference of Malaria Field Workers, engaged in co-operative malaria control operations, met conjointly with the Southern Medical Association, Chattanooga, Tenn., November 13-16, 1922. The program of this Conference was made up almost altogether of papers by sanitary engineers and was well attended and was a most helpful Conference. No report of the proceedings of this Conference has been made available for our minutes. It is understood that the program was carried out substantially as it appeared on page 951 of the November (1922) issue of the Journal.

SOUTHERN HOSPITAL ASSOCIATION

Auxiliary of Southern Medical Association

Officers

President—Dr. Stewart R. Roberts, Atlanta, Ga.
Vice-President—Dr. Battle Malone, Memphis, Tenn.
Secretary—Mr. J. B. Franklin, Dallas, Tex.

Monday, November 13, 9:30 a. m.

The Association met in the Criminal Court Room, County Court House, Chattanooga, Tenn., and was called to order by the President, Dr. Stewart R. Roberts, Atlanta, Ga., who read his President's Address entitled "Growth in Medicine."

Dr. Sydney R. Miller, Baltimore, Md., read a paper entitled "Nursing Homes."

Mr. Walker White, Superintendent, Wesley Memorial Hospital, Atlanta, Ga., read a paper entitled "The University Campus Hospital."

Papers of Dr. Miller and Mr. White were discussed by Drs. T. Z. Cason, Jacksonville, Fla.; L. B. McBrayer, Sanatorium, N. C.; Stewart R. Roberts, Atlanta, Ga., and in closing by Mr. White.

Dr. R. B. McBride, Dallas, Tex., read a paper entitled "Group Medicine: A Process of Evolution."

Dr. Warren T. Vaughan, Richmond, Va., read a paper entitled "Group Medicine: A Critical Survey."

Papers of Dr. McBride and Dr. Vaughan were discussed by Drs. D. C. Walt, Little Rock, Ark.; Sydney R. Miller, Baltimore, Md.; T. Z. Cason, Jacksonville, Fla.; L. B. McBrayer, Sanatorium, N. C.; E. B. Bradley, Lexington, Ky.; C. L. Minor, Asheville, N. C.; T. P. Sprunt, Baltimore, Md., and in closing by Dr. McBride.

At the close of the scientific program a discussion was held regarding the continuation of the Southern Hospital Association as an auxiliary of the Southern Medical Association.

Dr. Stewart R. Roberts, Atlanta, Ga., said he had been informed by Mr. C. P. Loranz, Secretary-Manager of the Southern Medical Association, that the Association office had spent much time on, and given much thought to, this auxiliary, that much had been done to get doctors in the South interested in it with little to show for the effort. In the light of the experience the past three years it seemed to him that a hospital association to be made worth while would have to include the lay people connected with these institutions and this would not be possible with the organization a part of the Southern Medical Association, for the Association's by-laws permitted to membership only those who were doctors of medicine, members of their county and state medical societies.

Dr. Roberts suggested that the matter of the formation of a Southern Hospital Association be delegated to Mr. J. B. Franklin, Superintendent of Baylor Hospital, Dallas, Tex., and Mr. Walker White, Superintendent of the Wesley Memorial Hospital, Atlanta, Ga. Dr. Roberts stated that more than one-third of the hospitals in the United States were located within the borders of the Southern Medical Association.

In his opinion it seemed advisable, with the consent of the present body, to organize a Southern Hospital Association which would not be a part of the Southern Medical Association but meet conjointly with the Southern Medical Association, and to which the members of the Southern Medical Association might of their choice attend and might be, from time to time, requested to present papers or participate in the discussions.

Mr. J. B. Franklin said this was the third meeting of the Southern Hospital Association as an auxiliary of the Southern Medical Association, and it was thought last year it might develop into a permanent organization, but enough people were not present this year to make this possible. The South covers a large territory. If the Mississippi River was made the dividing line, two associations, a Southeastern and a Southwestern, might be formed. The people in the South are not sufficiently interested in hospital matters to go far to meetings. Later on the two organizations, Southeastern and Southwestern, might be combined.

Mr. Franklin moved that hereafter no attempt be made to hold a meeting of the Southern Hospital Association, as an auxiliary of the Southern Medical Association. This motion was lost for lack of a second.

Dr. T. Z. Cason, Jacksonville, Fla., asked whether the proposed organization would be composed entirely of hospital people, whether it would offer a program along administrative lines rather than on medical lines. He said in an organization composed of lay people in the majority it would not be possible to get a discussion of medical subjects.

Mr. Walker White, Atlanta, Ga., believed there was a great deal in agreement between hospital executives and the medical profession. He, as a layman, is interested in the various problems that concern the medical profession and the hospital. He wished it were possible to have the hospital section of the Southern Medical Association. If this were not possible, he felt that two organizations should be established with the Mississippi River as the dividing line.

Dr. L. B. McBrayer, Sanatorium, N. C., disagreed with Mr. Franklin regarding the status of the medical profession and the hospital. He felt that the hospitals could not run without the medical profession. He thought it would be possible to get up a program that varied sufficiently to interest the medical and non-medical members of a hospital staff. A large majority of the hospitals in the South are owned and run by doctors.

Dr. George E. Adkins, Jackson, Miss., asked what would constitute a hospital that would be eligible for admission to the Southern Hospital Association. The majority of Southern hospitals do not conform to the rules and regulations of the American College of Surgeons and if they had to conform, at least 90 per cent of them would have to close their doors because they consist of from five to fifty beds, are owned by individuals and their superintendents are usually well trained nurses who have some executive ability.

Dr. R. B. McBride, Dallas, Tex., moved that the President appoint a committee to investigate and report on this matter. Motion carried. The President appointed on this Committee: Mr. J. B. Franklin, Chairman, Dallas, Tex.; Dr. T. Z. Cason, Jacksonville, Fla., and Dr. George E. Adkins, Jackson, Miss.

Dr. T. Z. Cason, Jacksonville, Fla., said that Dr. Adkins had presented the real situation in the South and that although the work done in these small hospitals was of high class, they were not recognized by the American College of Surgeons because the number of beds were not sufficient.

Dr. Stewart R. Roberts, Atlanta, Ga., said he was not willing to lose Mr. Franklin from the Southeast. He is too important a man and has built up too many hospitals to content himself even in the State of Texas. He hoped the hospital executives would see fit to form a Southern Hospital Association and not to bisect it even in the median line.

Mr. J. B. Franklin said he wished to correct a misapprehension. He would not say that hospital staffs would not be members of the Southern Hospital Association. He was not opposed to the Southern Hospital Association, but felt greater good might be accomplished by having it in two sections.

The Association then adjourned sine die.

CONFERENCE ON MEDICAL EDUCATION

Officers

Chairman—Dr. I. I. Lemann, New Orleans, La.
Vice-Chairman—Dr. M. L. Graves, Galveston, Tex.
Secretary—Dr. W. McKim Marriott, St. Louis, Mo.

Monday, November 13, 9:30 a. m.

The Conference met in the Stone Church, Chattanooga, Tenn., and was called to order by the Chairman, Dr. I. I. Lemann, Tulane University, New Orleans, La., who read his Chairman's Address entitled "The Teaching of Physical Diagnosis and Its Position in the Curriculum." which was discussed by Drs. Charles L. Minor, Asheville, N. C.; Louis Hamman, Baltimore, Md.; Frank K. Boland, Atlanta, Ga.; Robert Wilson, Jr., Charleston, S. C.; W. McKim Marriott, St. Louis, Mo., and in closing by the essayist.

Dr. Louis Hamman, Johns Hopkins University, Baltimore, Md., read a paper entitled "The Use of the Dispensary in the Teaching of Clinical Medicine."

Dr. Isidore Cohn, Tulane University, New Orleans, La., read a paper entitled "The Use of the Dispensary in the Teaching of Clinical Surgery."

Papers of Dr. Hamman and Dr. Cohn were discussed by Drs. Marcy J. Lyons, New Orleans, La.; Douglas VanderHoof, Richmond, Va.; M. L. Graves, Galveston, Tex.; Charles L. Minor, Asheville, N. C.; Robert Wilson, Jr., Charleston, S. C.; Tom A. Williams, Washington, D. C.; Lewis J. Moorman, Oklahoma City, Okla.; I. I. Lemann, New Orleans, La., and in closing by the essayist.

The Chairman appointed the following as a Nominating Committee: Dr. Robert Wilson, Jr., Charleston, S. C.; Dr. Douglas VanderHoof, Richmond, Va., and Dr. Wm. H. Olmsted, St. Louis, Mo.

Dr. M. F. Arbuckle, Washington University, St. Louis, Mo., read a paper entitled "The Teaching of Surgical Specialties," which was discussed by Dr. H. W. E. Walther, New Orleans, La.

The Nominating Committee reported as follows, the nominees being unanimously elected:

For Chairman: Dr. M. L. Graves, Galveston, Tex.
For Vice-Chairman: Dr. W. McKim Marriott, St. Louis, Mo.
For Secretary: Dr. C. C. Bass, New Orleans, La.

It was moved by Dr. F. K. Boland, Atlanta, Ga., that the Secretary of this Section be instructed before the next meeting to take up with the deans of all medical schools and colleges in the sixteen states covered by the Southern Medical Association the matter of attendance at this Conference, urging them to send more delegates to this Conference. The motion carried.

The Conference then adjourned sine die.

SECTION OF MEDICAL DIRECTORS OF SOUTHERN LIFE INSURANCE COMPANIES

The Medical Directors of Southern Life Insurance Companies in the states comprising the Southern Medical Association met in a dinner session at the call of Dr. John B. Steele, Medical Director, Volunteer State Life Insurance Company, Chattanooga, Tenn., at the Mountain City Club, Chattanooga, Tuesday, November 14, at 12:30 p. m., those present being the guests of Dr. Steele.

Dr. Steele called the meeting to order and in a short talk pointed out the value of closer contact between the medical directors of Southern life insurance companies and advised the organization of a section for that purpose. After an informal discussion of the question it was unanimously decided to meet each year at a luncheon or dinner and to limit the program to three papers.

Dr. M. Y. Dabney, Assistant Medical Director, Protective Life Insurance Company, Birmingham, Ala., was requested to go before the Council of the Southern Medical Association and ask for recognition of this organization as a regular section of the Association to be known as the Section of Medical Directors of Southern Life Insurance Companies.

The following officers were elected subject to the approval of the Council when presenting this request for a section:

Chairman, Dr. John B. Steele, Medical Director, Volunteer State Life Insurance Company, Chattanooga, Tenn.

Vice-Chairman, Dr. J. W. Handley, Medical Director, Independent Life Insurance Company, Nashville, Tenn.

Secretary, Dr. R. C. Maddox, Assistant Medical Director, Volunteer State Life Insurance Company, Chattanooga, Tenn.

The Section then adjourned.

(At a meeting of the Council held Wednesday, November 15, the request for this Section was granted.)

CONFERENCE OF PRESIDENTS AND SECRETARIES OF STATE MEDICAL ASSOTIONS AND STATE HEALTH OFFICERS

The Presidents and Secretaries of State Medical Associations and State Health Officers of the sixteen Southern states comprising the Southern Medical Association held their annual dinner and conference, as guests of the Association, in the Grill Room of the Hotel Patten, Chattanooga, Tenn., Tuesday, November 14, 1922, at 6:30 p. m., Dr. E. A. Hines, Secretary-Editor, South Carolina State Medical Association, Seneca, S. C., presiding.

Dr. Seale Harris, President, Southern Medical Association, Birmingham, Ala., was the first speaker, dwelling especially on the excellent results that had been obtained by the cooperation between the officers of state medical associations and state health officers of the Southern states and officers of the Southern Medical Association.

Dr. James A. Hayne, State Health Officer, Columbia, S. C., gave a brief address on the "Relation of Organized Medicine to Public Health Problems of Today."

Dr. Holman Taylor, Secretary-Editor, Texas State Medical Association, Fort Worth, Tex., discussed the suggestion made by the retiring President of the American Medical Association to divide the Country into sectional districts for the purpose of holding fall and winter scientific meetings. There was a free and informal discussion of Dr. Taylor's remarks, following which Dr. Graham E. Henson, Secretary-Editor, Florida State Medical Association, Jacksonville, Fla., offered the following resolutions, which were unanimously adopted:

Whereas, It has been suggested by Dr. Hubert Work, the recently retiring President of the American Medical Association, that the territory comprising the said American Medical Association be divided into districts composed of appropriately grouped state medical associations, and that regional medical societies be organized to cover, with the definite object of discussing such scientific problems as they may choose and which may be of regional importance, of electing trustees of the American Medical Association and making recommendations for suitable material for President-elect of the American Medical Association; and,

Whereas, The matter is to be discussed by the Conference of State Secretaries to be held in Chicago, November 17 and 18; and,

Whereas, It is believed that the formation of such regional societies in the manner recommended and for the purpose stated would be of no advantage to the Southern states; rather, it is believed that such procedure would be detrimental, not only to the Southern states but to organized medicine in general; therefore, be it

Resolved, That the Presidents and Secretaries of State Medical Associations and the Public Health Officials of the sixteen Southern states comprising the territory of the Southern Medical Association, as at present organized, go on record as opposing such project; and be it further

Resolved, That copies of these resolutions be forwarded to the Committee of the American Medical Association appointed to consider and report upon the proposal, and a copy referred to the Conference of State Secretaries above referred to and to other sectional medical organizations throughout the United States for the information of all concerned.

It was suggested that although this Conference is always informal, that it probably could be made more valuable to those attending if a Chairman and Secretary were elected each year to arrange a program, etc. It was moved and carried that the suggestion be carried into effect and the following officers were then elected for the ensuing year:

Chairman, Dr. E. A. Hines, Secretary-Editor, South Carolina State Medical Association, Seneca, S. C.

Secretary, Dr. Graham E. Henson, Secretary-Editor, Florida State Medical Association, Jacksonville, Fla.

Among those present at this Conference and dinner were: Dr. S. W. Welch, State Health Officer of Alabama, Montgomery, Ala.; Dr. Henry G. Perry, Secretary, Alabama State Medical Asssociation, Montgomery, Ala.; Dr. Robert Caldwell, President, Arkansas State Medical Society, Little Rock, Ark.; Dr. Wm. R. Bathurst, Secretary-Editor, Arkansas State Medical Society, Little Rock, Ark.; Dr. Leonidas M. Anderson, President, Florida State Medical Association, Lake City, Fla.; Dr. Graham E. Henson, Secretary-Editor, Florida State Medical Association, Jacksonville, Fla.; Dr. J. M. Smith, President, Georgia State Medical Association, Valdosta, Ga.; Dr. Louis Frank, President, Kentucky State Medical Associa-

tion, Louisville, Ky.; Dr. Paul J. Gelpi, President, Louisiana State Medical Association, New Orleans, La.; Dr. Oscar Dowling, State Health Officer of Louisiana, New Orleans, La.; Dr. W. S. Leathers, State Health Officer of Mississippi, Jackson, Miss.; Dr. John Wesley Long, President, North Carolina State Medical Association, Greensboro, N. C.; Dr. L. B. McBrayer, Secretary, North Carolina State Medical Association, Sanatorium, N. C.; Dr. J. Howell Way, President, State Board of Health of North Carolina, Waynesville, N. C.; Dr. E. A. Hines, Secretary-Editor, South Carolina State Medical Association, Seneca, S. C.; Dr. James A. Hayne, Health Officer of South Carolina, Columbia, S. C.; Dr. Holman Taylor, Secretary-Editor, Texas State Medical Association, Fort Worth, Tex.; Dr. Ennion G. Williams, State Health Commissioner of Virginia, Richmond, Va.; Dr. Henry Hanson, Peru; and Dr. Seale Harris, President, Southern Medical Association, Birmingham, Ala.

SOUTHERN ASSOCIATION OF ANESTHETISTS

Meeting Conjointly with Southern Medical Association

Organization Meeting

Officers

President—Dr. Ansel M. Caine, New Orleans, La.
First Vice-President—Dr. Olin W. Rogers, Knoxville, Tenn.
Second Vice-President—Dr. Nettie Klein, Texarkana, Tex.
Secretary-Treasurer—Dr. W. Hamilton Long, Louisville, Ky.

Tuesday-Wednesday, November 14-15, 1922

The Anesthetists of the South met in organization session at the Read House, Chattanooga, Tenn., November 14-15, 1922, and were called to order by the Honorary Chairman, Dr. F. H. McMechan, General Secretary, Associated Anesthetists, Avon Lake, Ohio, who presented the gavel to the Organization Chairman, Dr. Ansel M. Caine, New Orleans, Louisiana.

Dr. Edward T. Newell, Chattanooga, Tenn., delivered a brief address of welcome, which was responded to on behalf of the Anesthetists by the Honorary Chairman, Dr. McMechan.

Dr. W. Hamilton Long, Organization Secretary-Treasurer, reported the progress made in organization. It was decided to make permanent this temporary organization and a constitution and by-laws were adopted. The name of the organization to be the "Southern Association of Anesthetists" and to meet annually. Provision was made for active, associate and honorary members. The active members must live and practice in the Southern states proper, the associate are those who live without the territory of the Association, and the honorary those whose work in anesthesia has been especially outstanding and distinctive. The only honorary member elected was Dr. F. H. McMechan.

The following organization officers were elected for the ensuing year: President, Dr. Ansel M. Caine, New Orleans, La.; First Vice-President, Dr. Olin W. Rogers, Knoxville, Tenn.; Second Vice-President, Dr. Nettie Klein, Texarkana, Tex.; Secretary-Treasurer, Dr. W. Hamilton Long, Louisville, Ky.

The following were named as the Executive Committee: I. W. Cooper, M.D., Meridian, Miss.; Thos. J. Collier, M.D., Atlanta, Ga.; A. R. Beyer, M.D., Tampa, Fla.; Harry Harrison, M.D., Norfolk, Va., and P. N. Ogle, D.D.S., Knoxville, Tenn.

The two following resolutions were presented and unanimously approved by the Association:

Whereas, The Southern Medical Association has taken steps toward securing proper recognition of the pioneer work in anesthesia of Crawford W. Long, definitely proven to have been the first to perform an operation under ether anesthesia; therefore, be it

Resolved, That the Southern Association of Anesthetists, now duly and permanently organized, does hereby offer its hearty cooperation and support to the Southern Medical Association in this worthy effort to put Crawford W. Long's name among those of the truly great benefactors of mankind.

Whereas, The Southern Association of Anesthetists, now duly and permanently organized and pledged to the advancement of scientific anesthesia in the South, has received in its organization work the hearty support and assistance of the Southern Medical Association, proffered through that organization's Secretary-Manager and official representative; therefore, be it

Resolved, That the Southern Association of Anesthetists hereby extends its appreciation to the Southern Medical Association for this assistance and cooperation and looks forward to a continuation of this cooperation at future meetings.

A facsimile of the memorial tablet to Crawford W. Long in the Medical Department of the University of Pennsylvania is to be used as the emblem of the Association for their official stationery.

The meeting throughout was marked by much enthusiasm and interest which was encouraging to those responsible for launching the organization. The Association starts with a charter membership of more than sixty.

The following papers were read in the scientific program:

"The Problem of Service in the Relation of the Professional Anesthetist to the Surgeon" (Chairman's Address), Dr. Ansel M. Caine, New Orleans, La.

"The Technic of Insufflation Anesthesia and Position and Preparation of Patients in Nasal and Oral Operations," Dr. J. G. Poe, Dallas, Tex.

"Hypotension in Relation to Surgical Conditions and Operative Risks," Dr. Stewart R. Roberts, Atlanta, Ga.

"The 'Safety-First' Campaign of the Associated Anesthetists. The Breath-Holding Test and Its Practical Value in Predetermination of the Surgical Risk" (lantern slides), Dr. F. H. McMechan, Honorary Chairman, General Secretary, Associated Anesthetists, Avon Lake, Ohio.

"Synergistic Analgesia," Dr. F. D. Smythe, Memphis, Tenn.

"The Anesthetist on the Hospital Staff," Dr. D. Y. Keith, Louisville, Ky.

"A Consideration of Nitrous-Oxide-Oxygen in Obstetrics," Dr. E. I. McKesson, Toledo, Ohio.

"New Ethers and Their Application," Dr. Ben Morgan, Chicago, Ill.

REGISTRATION

Chattanooga Meeting, Southern Medical Association, November 13-16, 1922

	No. Doctors	No. Ladies Accompanying Doctors
Alabama	148	42
Arkansas	37	12
District of Columbia	10	1
Florida	37	8
Georgia	165	39
Kentucky	108	39
Louisiana	47	7
Maryland	26	4
Mississippi	57	14
Missouri	40	10
North Carolina	58	10
Oklahoma	17	5
South Carolina	46	7
Tennessee (outside of Chattanooga)	296	61
Chattanooga (Tenn.)	107	....
Texas	50	12
Virginia	32	4
West Virginia	8	3
Other states	48	8
Totals	1337	286
Scientific Exhibits, Association Office, Etc.	26	
Commercial Exhibits	129	3
	1492	289
Ladies	289	
Grand total	1781	

These figures were compiled from the card registration. There are always quite a number of doctors attending the meeting who neglect to register at the Association headquarters. The number who attend such meetings and fail to register is variously estimated at from 10 to 15 per cent of the total registration. If we take 10 per cent as a fair estimate, adding that to the 1337 doctors registered, we have an apparent attendance of 1470 doctors and a grand total of 1914.

GOLF TOURNAMENT

Forty-eight visiting physicians participated in the annual golf tournament of the Southern Medical Association at its sixteenth annual meeting in Chattanooga. The local committee on arrangements provided handsome cups for trophies.

Dr. Joseph A. Elliott, Charlotte, N. C., won the championship trophy with a score of 86. A handicap competition which was played in connection with the championship event was won by Dr. Fred G. Hodgson, Atlanta, Ga., who shot a 100 and was allowed a handicap of 20 for a net score of 80.

The tournament was played at medal play, one round, doctors playing as they had leisure. It is estimated that more than one hundred doctors used the course during the convention, although only forty-eight competed in the tournament.

The playing was on the Riverview course of the Chattanooga Golf and Country Club. There were many compliments by the visiting doctors on this splendid course.

Southern Medical News

ROENTGEN RAY MEETINGS

The fourth annual meeting of the Eastern Section of the American Roentgen Ray Society will be held at the Ritz-Carlton Hotel, Atlantic City, N. J., January 25, 26 and 27, 1923. All roentgenologists of the East will be expected to attend, and visitors from other sections are cordially invited to be present. An interesting program is being prepared. All communications with respect to this meeting should be addressed to Dr. Charles A. Waters, President, Eastern Section, American Roentgen Ray Society, 1100 North Charles street, Baltimore, Md.

The Central Section of the American Roentgen Ray Society will hold its mid-winter meeting in Louisville, Ky., Saturday, February 24, for one day, including an evening session. All those interested in x-ray work are urged to attend, the officers stating that they will be well repaid for this one day's absence from their office. Dr. E. C. Ernst, St. Louis, is President, and Dr. D. Y. Keith, Louisville, Secretary. Communications in respect to this meeting should be addressed to the Secretary.

ALABAMA

Dr. E. D. Bondurant, Mobile, was re-elected to membership in the National Committee for Hental Hygiene at the thirteenth annual meeting in New York, November 9.

Dr. William Wilks Burns, Selma, announces that he is now associated with Drs. F. G. DuBose, D. H. Doherty, C. C. Elebash, S. Kirkpatrick and J. S. Chisholm, of the Vaughan Memorial Hospital, in the practice of group medicine.

The Tennessee Valley unit of the State Laboratory will be established in the Malone Building, Albany, according to an announcement by Dr. Havens, of the State Board of Health.

Deaths

Dr. Elchana Gardner Ford, Troy, aged 81, died November 3 at the home of his son in Bradleyton, from mitral insufficiency.

Dr. Felix Marcus Tulius Tankersley, Luverne, aged 62, died October 31 from cerebral hemorrhage.

ARKANSAS

The Medical Association of the Southwest held its seventeenth annual meeting in Hot Springs, October 16-18. The following officers were elected: Dr. Fred H. Clark, Dawson Springs, Ky., President; Drs. Clinton K. Smith, Kansas City, Mo., Williston H. Addington, Altoona, Kan., R. E. House, Ferris, Tex., and J. H. Buckley, Fort Smith, Ark., Vice-Presidents; Dr. Edward H. Skinner, Kansas City, Mo., Secretary-Treasurer. The 1923 meeting will be held in Kansas City, Mo., in October.

Washington County Medical Society has elected the following officers: Dr. F. R. Morrow, Fayetteville, President; Dr. E. G. McCormick, Prarie Grove, Vice-President; Dr. P. L. Hathcock, Fayetteville, Secretary; Dr. J. R. Southworth, Fayetteville, Treasurer.

Deaths

Dr. Charles P. Jones, Cherry Valley, aged 70, died November 13.

Dr. John W. Melton, Benton, aged 50, was instantly killed December 8 when the automobile he was driving was struck by a train.

DISTRICT OF COLUMBIA

The fall meeting of the Medical Society of Virginia, Maryland and the District of Columbia was held in Washington, November 22.

The World's Dairy Congress Program Committee on Regulation and Control held a meeting in Washington in November. The President of the Congress stated that Canada is one of the leaders in the grading of butter and cream.

All the members of the fire and police force, including women in the police department, at Washington, will have their blood typed and a record kept of it in order to provide against delay and to protect injured firemen or policemen in the event of immediate blood transfusion being necessary. The work of grouping the blood of the 1,723 members of both departments is being carried out by Dr. Oscar B. Hunter, Pathologist of the Georgetown University, Washington.

The cornerstone of the new $500,000 medical school building at Walter Reed General Hospital, Washington, was laid November 13. The building will be ready for occupancy by April 1, 1923. It will contain a memorial tablet to members of the medical service who lost their lives in France during the World War.

During local cancer week at Washington it was announced that Albert D. Lasker, Chairman of the U. S. Shipping Board, had donated $25,000 to the American Society for the Control of Cancer, in recognition of the excellent work that has been done by the Washington committee.

Dr. Rupert Blue, former Surgeon-General, United States Public Health Service, Washington, has been elected to attend the Near Eastern conference at Lausanne. He is Assistant Surgeon-General in charge of the European offices of the Public Health Service, with headquarters at Paris.

The cornerstone of the new $1,000,000 building of the National Academy of Sciences and of the National Research Council, Washington, was laid October 30. The fund was provided by the Carnegie Corporation of New York. The building will be ready for occupancy next fall.

Deaths

Dr. James A. Dickinson, Washington, aged 74, died November 11.

Dr. Edgar Williams Watkins, Washington, aged 65, died November 2 at the Garfield Memorial Hospital.

FLORIDA

Dairy and health inspectors from most of the large city and county health departments in the State held a health convention in Tampa, November 9-11. The following committee was appointed to advance desirable legislative features in connection with enforcement of state health laws: Hotel Commissioner Carter; Dr. J. G. Fish, U. S. Department of Agriculture; A. W. Zeibald, Miami, City Food Inspector; Capt. R. E. Rose, State Chemist; Dr. J. R. Harris, City Health Officer, Tampa.

The Hillsborough County Antituberculosis Association was recently organized in Tampa. It is proposed to affiliate the Association with the Florida Public Health Association. The following were elected officers: Dr. Allen F. Higgins, Tampa, President; W. F. Barnwell, Secretary.

GEORGIA

Randolph County Medical Society has elected the following officers: Dr. T. F. Harper, Coleman, President; Dr. E. C. McCurdy, Shellman, Vice-President; Dr. G. Y. Moore, Cuthbert, Secretary-Treasurer; Dr. F. S. Rogers, Coleman, Censor for three years; Dr. F. D. Patterson, Cuthbert, Censor for two years; Dr. W. W. Crook, Cuthbert, Censor for one year.

Floyd County Health Council was recently organized in Rome, for the purpose of holding a series of public health lectures in order to instruct the public in the care and prevention of disease. The following officers were elected: Dr. William H. Lewis, President; Dr. Buena V. Elmore, Secretary.

Fulton County Medical Society, Atlanta, has bought a house to be known as Academy of Medicine. The first floor has an auditorium which will seat 350 people, and four other rooms to be used as a library. The other floors will be used by physicians as living quarters.

The Crawford W. Long Memorial Association has been chartered, with Dr. F. K. Boland, President, Dr. Joseph Jacobs, Vice-President, and Dr. W. J. Blalock, Treasurer.

The object of the organization is to raise a sufficient fund to place a statue to Crawford W. Long in the Hall of Fame, at Washington, D. C. The state legislature of Georgia voted to place Long's statue in Washington twenty years ago, but has never provided the means for carrying out the project. The amount of $3,000 is already in the hands of the Association. It is estimated that $7,000 more will be required. Contributions of any size, to this fund, are solicited from the medical profession of the South. Checks should be mailed to W. J. Blalock, Treasurer, care Fulton National Bank, Atlanta, Ga.

Dr. Forrest M. Barfield and Miss Dorothy Virginia Orr, both of Atlanta, were married November 2.

Dr. Murdock Sykes Equen and Miss Anna Cornelia Hart, both of Atlanta, were married October 25.

Deaths

Dr. R. C. Carr, Foster Mills, aged 80, died October 17 from cerebral hemorrhage.

Dr. E. B. Weldon, Inman, aged 79, died October 14 from senility.

Dr. J. R. Henderson, Sandersville, aged 65, died September 29 from cerebral hemorrhage.

Dr. John Osborne Teasley, Lilly, aged 45, died October 28.

Dr. Lodrick M. Jones, Milledgeville, aged 72, died December 7 following an attack of erysipelas.

KENTUCKY

LaRue County Medical Society has elected the following officers: Dr. D. W. Gaddie, President; Dr. T. J. Poteet, Vice-President; Dr. Leigh Maupin, Secretary.

The following have been appointed to the staff of the Illinois Central Railroad Hospital, Paducah: Dr. P. H. Stewart, Attending Surgeon; Dr. S. B. Pulliam, Attending Physician; Dr. Campbell H. Johnson, Attending Specialist of the Eye, Ear, Nose and Throat.

Dr. H. E. Whitledge, recently in charge of the new Government Hospital at Dawson Springs, is now in charge of the Government hospitals of the United States in Washington, D. C.

The School of Public Health, operated jointly by the University of Louisville and the State Board of Health, which has for its function the training of public health nurses and physicians, is now fully opened.

The State Board of Health has authorized the establishment of tubercular clinics in some of the remote counties throughout the State.

A joint meeting of the medical societies of Fulton and Hickman Counties, Kentucky, and Dyer and Obion Counties, Tennessee, was held at Walnut Log Hotel, Reelfoot Lake, October 10, at which time a permanent society was organized, to be known as the Walnut Log Medical Society, which will hold its regular annual meetings at Walnut Log. The following officers were elected: Dr. H. E. Prather, Hickman, President; Drs. W. F. Peebles, Clinton, and M. A. Blanton, Union City, Tenn., Vice-Presidents; Dr. R. L. Motley, Dyersburg, Tenn., Treasurer; Dr. Ira Park, Union City, Tenn., Secretary.

Carlisle County Medical Society has elected the following officers: Dr. W. L. Mosby, President; Dr. D. S. Robertson, Vice-President; Dr. T. J. Marshall, Secretary-Treasurer.

Todd County Medical Society has elected the following officers: Dr. B. E. Boone, President; Dr. E. M. Frey, Vice-President; Dr. E. W. Bartlett, Secretary.

Dr. Henry Enos Tuley, Louisville, has resigned as Superintendent of the City Hospital on account of ill health.

The following changes in the Eastern State Hospital, Lexington, have been made: Dr. Edward Davenport will succeed Dr. John J. Carroll, who resigned as senior member of the medical staff; Dr. H. T. Thornburg, Toledo, Ohio, will succeed Dr. H. S. Seiwell, Kankakee, Ill., who resigned to become Superintendent of the State hospitals in Pennsylvania.

Miss Jessie Greathouse has succeeded Miss Nell Miller as Superintendent of the Clark County Hospital.

Deaths

Dr. Lee C. Wadsworth, Covington, aged 57, died November 22.

Dr. Joseph A. Baute, Somerset, aged 54, died November 26 after an illness of several months.

Dr. John L. Sowards, Greenup, aged 52, died suddenly November 28.

Dr. Edwin Thompson Bruce, Louisville, aged 42, died December 4 at St. Anthony's Hospital, following an operation for appendicitis.

Dr. Henry Orendorf, Lexington, aged 83, died December 7, following a long illness.

Dr. William J. Heizer, Lebanon Junction, aged 72, died November 30.

Dr. John E. Pace, Scottsville, aged 60, died November 24 following an operation.

LOUISIANA

The West Carroll Parish Medical Society was organized November 15. The Society will meet the second Wednesday of each month. The following officers were elected: Dr. J. A. Gaharon, Forest, President; Dr. B. T. Bailey, Epps, Secretary-Treasurer.

It has been announced that the Knights of America, a fraternal order, will erect a sanatorium in the near future near Panchatoula. The institution will accommodate twenty-four patients.

The Feliciana Medical Society has elected the following officers: Dr. E. E. Evans, President; Dr. James Kilborne, Vice-President; Dr. E. M. Toler, Secretary-Treasurer.

Dr. Louis A. Meraux has been appointed head of the St. Bernard Parish Health Board.

The library of Tulane University School of Medicine, New Orleans, has published a resume on the preservation of anatomy sections by Dr. Edmond Souchon, Professor of Anatomy at the University.

Dr. W. W. Knipmeyer has been appointed Health Director of Natchitoches Parish.

The staff of the Eye, Ear, Nose and Throat Hospital held an organization meeting November 6. Rules and regulations to conform with the requirements of the American College of Surgeons were adopted. The following officers were elected: Dr. H. D. Bruns, Chairman; Dr. R. C. Lynch, Vice-Chairman; Dr. C. A. Bahn, Secretary.

St. Luke's Private Sanatorium, New Orleans, will be formally opened soon. In addition to about thirty private rooms there will be accommodations for about 100 patients.

Dr. Gaston Trosclair, Thibodaux, has been appointed U. S. Surveyor of Customs.

Deaths

Dr. John Lewis Vialet, Baton Rouge, aged 72, died September 22.

Dr. George C. Sweeney, Grand Chenier, aged 71, died November 6 from acute gastroenteritis.

Dr. Andrew G. Friedrichs, New Orleans,, died October 14.

MARYLAND

The Johns Hopkins Medical Alumni Club was recently organized for past and present members of the hospital staff. The purpose of the organization is to furnish a combined club and home for visiting doctors and resident physicians of the hospital.

A free eye, ear, nose and throat clinic has been established at the Bay View General Hospital, in the eastern section of Baltimore, for removing adenoids and tonsils for children of that district whose parents are without means.

The first unit of the Louisa Parsons Nurses' Home of the University of Maryland, which was named for the first superintendent of the nurses' home of the hospital, was dedicated November 16.

The Middle Atlantic District of the Association of Hospital Workers was held in Baltimore November 21-22, at which time the various phases of social service work were discussed.

The estimated cost of the Marine Hospital to be erected at Baltimore is $189,000.

Baltimore City Medical Society has elected the following officers: Dr. Alexius W. McGlannan, President; Dr. Gordon Wilson, Vice-President; Dr. Frank S. Lynn, Secretary; Dr. Charles Emil Brack, Jr., Treasurer.

The Clinical Surgical Society met at the Johns Hopkins Hospital, Baltimore, November 16-17.

The new building for Peninsula General Hospital, Salisbury, will cost approximately $140,000.

Dr. Charles Sidney Burwell, Jr., and Miss Edith Mary Churchill, New York, were married October 10.

Dr. John A. Campbell Colston and Miss Harriet Lippincott Zell, both of Baltimore, were married November 9.

Deaths

Dr. Elias C. Fleming, Hurlock, aged 68, died October 31.

(Continued on page 38)

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SYMPOSIUM ON GALL-BLADDER DISEASE

GALL-BLADDER DISEASE*

By Martin E. Rehfuss, M.D.,
Philadelphia, Pa.

The technical problems connected with gall-bladder disease are many, but the fundamental principles remain the same. First of all, we must clearly visualize the status of this organ.

The gall-bladder must be considered as an integral part of the hepatoenteric system. We must think of the liver as one unit and the intestinal tract as the other unit, the two associated by connecting links which the French call the hepatoenteric circulation. This conception is vitally important, as it emphasizes the complete dependence of one link of the chain on the other portion, the afferent chain connecting the digestive tract to the liver and the biliary tract, the great efferent chain. The liver, like the kidneys, is to a large degree the excretion organ. The biliary tract is the transit system for bile, and the gall-bladder is a diverticulum in the course of this transit system. It certainly plays no very active part in upper abdominal digestion. The lack of the organ in many animals and the comparatively unimpaired digestion which occurs in individuals who have been submitted to cholecystectomy bear out this view. Boroman[1] considers the gall-bladder a rudimentary organ to the liver. Its embryological growth is that of a diverticulum, and it is a well known fact that the older authors considered the gall-bladder but a modified bile duct. It is also significant that it contains but 30 c. c. of bile, which is less than 5 per cent of the total output (500 to 1100 c. c.). Physiologically, it is supposed to store up bile and then expel it at need, but many observers, notably Auster and Crohn,[2] claim that the gall-bladder is anatomically an organ with scanty musculature and poor contractile power. They are inclined to believe that the outflow from the gall-bladder is in the nature of an overflow incontinence. Sweet's idea was that the gall-bladder was slowly drained by the milking effect of the common duct. Harrer, Horgis and van Meter[3] claim that the muscle walls are too weak for regular discharge. Whether or not the innervation of the gall-bladder and the sphincter of Oddi are reciprocal mechanisms is not quite clear. According to Oddi,[4] the tone of the sphincter is such that it has a resistance of 675 mm. of water, which exceeds the normal secretory pressure of bile by 475 mm. of water. Certainly the modern tendency is to believe that the organ is in a sense a safety valve for pressure in the common duct, and that it has power of concentrating the bile by absorption of water. Rous and McMaster[5] showed distinct differences in the quality of the bile from the gall-bladder and that from the ducts. They have shown that the inspissation of the bile in the gall-bladder can proceed with great rapidity, and Crohn is of the opinion that the bile in the gall-bladder takes a long period of time to evacuate, stasis occurring normally in digesting dogs up to 3 days, while the filling of the empty gall-bladder is an irregular and slow process. The power of concentration of bile is probably by means of the absorption of water in the lymphat-

*Read in Symposium on Gall-Bladder Disease, General Session, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

ics, injection of potassium sulphocyanid in the gall-bladder being followed by the presence of prussian blue in the periductal lymphatics. Alvarez[6] is of the opinion that the bile flow from the gall-bladder cannot be due to contraction of the organ, but occurs simply because the pressure in the common duct has been lowered by relaxation of the sphincter at the duodenal end. That the gall-bladder, however, concentrates bile, acts as a safety valve and secretes mucus must be evident. What we are concerned with, however, is its etiology.

ETIOLOGY

As one studies the anatomy and physiology of the gall-bladder a number of points become clear. The first important point is the fact that the gall-bladder serves in some way as a storage place for a moderate amount of bile. It therefore follows that the nature of the bile will in a sense determine certain conditions affecting the organ. (2) The nature of the bile is dependent upon the integrity of the liver cell. (3) The liver cell is dependent upon the character of the portal blood, and finally the character of the portal blood is dependent upon the nature of the intestinal contents. This is the line of reasoning which has made Chauffard say that the liver cell was in a sense the responsible agent in cholelithiasis. Certainly the two great problems with which the medical world has to contend in gall-bladder disease, apart from the rare tumors and comparatively unusual systemic diseases, are, first, the question of infection of the organ, and second, the formation of calculi. These problems may be entirely separate or associated, and in as much as the understanding of these problems is absolutely essential to the medical treatment of the condition, I shall discuss some of the facts in detail.

Two of the great advances of modern medicine are, first, the discovery of the extraordinary selective localization of bacteria of a given virulence in certain parts of the body; and second, the extraordinary selective elimination of bacteria. The most complete exponent of electivle lesions is Rosenow,[7] and in his last communication streptococci from gall-bladder lesions showed a localization in the gall-bladder of animals in 80 per cent of cases. Equally significant was the fact that 21 per cent of the animals receiving ulcer strains showed a localization in the gall-bladder, while 29 per cent of the animals receiving gall-bladder strains showed a localization in the stomach and duodenum. This would argue for the fact that with a certain virulence these organisms can strike the upper digestive tract and assume predilection through the gall-bladder, duodenum or stomach. Furthermore, it explains the association of these lesions.

Regarding the selective elimination of organisms, Richet, many years ago, pointed out the specific elimination of the colon typhoid group through the liver and biliary passages. Meyer, Neilson and Feusier[8] pointed out the fact that 20 to 30 per cent of the typhoid bacteria injected intravenously in rabbits were found in the liver in 10 to 15 minutes after inoculation. The same authors look on a gall-bladder infection as a sequel rather than a cause of repeatedly infected bile. Gall-bladder bile can be bacteriostatic, but is rarely bactericidal, and once bacteria gain the wall of the gall-bladder they multiply, invade the mucosa and spread by the lymphatics. It is interesting to note in this connection the studies of Richet.[9] He found that 51 per cent of 408 specimens of gall-bladder removed at operation showed a positive culture. The Bacillus coli was found in 27 per cent, the Bacillus typhosis in 7 per cent, the paratyphoid bacillus and the Bacillus alkaligenes fecalis each 2 per cent. The components of the Bacillus mucosus capsulatus group were found in 11 per cent of cases, and in 8 of the 9 instances where these organisms were found, 7 showed empyema. The green streptococci were twice as frequent as the hemolytic streptococci and curiously enough the mouth streptococci mitis and salivarius were twice as frequent as the streptococcus fecalis, the normal inhabitant of the bowel. This lesson is suggestive in as much as it indicates that of the culture infections certainly lesions of the upper respiratory tract can be considered as a precursor more frequently than the streptococcus of the bowel. Deaver and Reiman[10] found green streptococci in 20 per cent of

the walls of 45 gall-bladders removed, while no hemolytic streptococci were encountered. Scheele[11] found 63 per cent positive cultures of the walls of gall-bladders removed at operation. Bacteria were also found in the adhesions of the ducts around the gall-bladder and in the hepatic bed of the gall-bladder. In other words, it is generally acknowledged that infection of the gall-bladder takes place either through hematogenous sources or through hepatogenous sources. Furthermore, according to Sherrington,[12] damage to the hepatic cell is a precursor to the appearance of bacteria in the intrahepatic bile current. We consider this an extremely important statement, in as much as it tends to substantiate the trend of recent work along these lines. An intact liver cell is not likely to produce an infected type of bile. Furthermore, all the evidence seems to indicate that in chronic inflammations of the gall-bladder there is an infiltration of bacteria which cannot be reached by any known method of local treatment. Hartman, of the Mayo Clinic, has called attention to this fact. As the question of infection now stands, focal infections, the condition of the blood stream and the integrity of the hepatic cell are the determinants in gall-bladder pathology.

On the other hand, there is another type of individual who is clearly predisposed to biliary lithiasis. Chauffard[13] calls attention to the fact that there is a group of individuals who are hypercholesterolemic and lithiasic and in whom the biliary mechanism is deficient. In this group the individual can form cholesterol stones, and an attempt is made to show the association of this stone with an alteration in systemic body chemistry. The assumption is that there is an increase in circulating cholesterol, and corresponding to this increase there is an increase in the cholesterol of the bile. Ordinarily this cholesterol is held in solution by the bile salts, but under certain conditions there is hepatic insufficiency with an insufficient formation of bile salts and the resulting precipitation of cholesterol. Chauffard and his co-workers believe the liver cell is at fault, and furthermore that the determinant effecting the liver cell is the chemistry of the intestinal tract. In our laboratories we have attempted to throw light on the circulating cholesterol. On the other hand, in certain cases of clean-cut cholesterol stone, there was no evidence whatsoever of such an increase. The only explanation of this phenomenon is the probability that at certain periods there is a marked increase in cholesterol with the formation of stones, followed by periods in which the cholesterol is either normal or subnormal. There are many other things besides these mechanisms which apparently are associated with a high blood cholesterol. Syphilis, diabetes and arterial sclerosis are all found to be associated with it. On the other hand, Chauffard has shown quite clearly that in the latter months of pregnancy, especially the last three months and after delivery for several weeks, there is a pronounced increase in circulating cholesterol, a phenomenon which is associated with the frequency of gall stone phenomenon at this time. They were also able to show that the convalescent typhoid case shows an increase in blood cholesterol, a phenomenon which is not altogether at variance with the frequency of gall-bladder phenomena. These facts emphasize one point, and that is that there are individuals who are predisposed to calculus owing to errors in metabolism. Chauffard was of the opinion that the suprarenal glands and the corpora lutea were cholesterogenic in function.

One more point of importance before we leave the question of the etiology of gall-bladder disease is the question of jaundice.

Within the last year considerable doubt has been thrown upon the evidence of jaundice as an obstructive phenomenon. Through the use of the Vanden Bergh serum test continental observers have been of the opinion that many of these forms of jaundice are in reality due to a disturbance in the liver cell, and not to duct obstruction. Hatiegan,[14] by means of the indigo carmine test in studies of catarrhal jaundice, was of the opinion that there was unquestionably a liver injury. Barlocco[15] was of the same opinion. Geronne[16] likewise was of the opinion, after the testing of the liver function by chromocholoscopy, that the liver cell was injured and that

there was not infection of the ducts in most of the cases of transient jaundice. Furthermore, Geronne is of the opinion that the so-called catarrhal jaundice and icterus gravis differ only in the degree of liver injury.

DIAGNOSIS

In the diagnosis of gall-bladder disease one naturally turns to the following methods of study: history of the case, physical examination, x-ray examination, duodenal intubation, and other tests such as that of the urinary findings, fecal examination and blood serum.

In the history of the case the typical history of pain in the upper right quadrant or in the epigastrium, radiating along the right costal margin to the back and to the right shoulder is naturally suggestive of gall-bladder disease. This is particularly the case when these phenomena are more or less localized with sudden onset, the presence of vasomotor shock, chills, gastric distention with or without vomiting, and recurring paroxysmal pain. The diagnosis is even more apparent if jaundice and slight rise in temperature, residual tenderness over the gall-bladder and bile in the urine are demonstrable. In common duct obstruction there may be sudden, severe colic followed in two or three days by jaundice with or without fever. We all know that stone in the ampulla of Vater often shows marked jaundice and obstruction and may show all the findings of intermittent fever. The clean-cut cases of gall-stone colic are rarely difficult to diagnose. It is that chronic type of case with few exacerbations but with reflected symptoms that is difficult. In these cases the history is usually one of a flatulent dyspepsia, irregular in character and combined with exacerbations which are more or less acute. Many of these cases never give a clean-cut history of colic, but it is precisely in this group of cases as in chronic appendicitis that the finding of chronic inflammation of the gall-bladder at operation is disclosed. In taking the history I consider of importance the following points: (1) evidence of localization to the gall-bladder area and also evidence indicating slight jaundice, changes in the color of the stool, of urine, and the evidence of some soreness or residual tenderness. From the gastric standpoint these individuals usually show a flatulent form of dyspepsia, usually made worse by fats, with distress and discomfort which lacks the regular painful recurrence of the ulcer syndrome. In the old gall-bladder cases there is usually evidence of a chronic gastritis. In the acute cases or during acute exacerbation the phenomena may be those of high secretion. The stomach, however, shows on x-ray examination no evidence of any organic defect, but aerophagia, evidence of low grade inflammation, and the patient frequently complains of persistent nausea, bile back flow into the stomach, and not infrequently, intractable heart burn. This is far more frequent than recurrent pain.

The third series of phenomena are those associated with the bowel. In most cases of chronic gall-bladder disease there is spastic constipation with left-sided contraction of the descending colon, with right-sided retention, and dilatation of the cecum and ascending colon, and with the presence of mucus in the movements. In most cases of chronic gall-bladder disease there is unquestioned association of intestinal phenomena. This is far more pronounced with gall-bladder disease than it is with gastric disease.

Physical examination may reveal localized phenomena in the neighborhood of the gall-bladder. It may reveal a residual point of tenderness, not infrequently slight enlargement of the liver, almost always a palpable cecum and contracted descending colon. Chetmonski[17] recommends shaking the patient with the fist in the gall-bladder region as a method of arousing distress and tenderness in chronic gall-bladder disease. By careful palpation of the abdomen it is usually possible to show a relatively greater sensitiveness and distress in the gall-bladder area.

X-ray examination of the gall-bladder region is a method which cannot be dispensed with. It attempts to demonstrate gall-bladder disease in one of three ways: first, by the direct evidence of either calculus or an enlarged gall-bladder. The latter is a not infrequent finding. The demonstration of calculus, however, is somewhat

disappointing. In my experience less than 30 per cent of operative demonstrable calculi can be shown by the double intensifying screen technic. On the other hand, indirect evidence of gall-bladder disease can be shown in the ordinary x-ray studies of the digestive tract and is one of the most important points in this consideration. Evidence of fixation of the duodenum, pressure defects, or irregularity of the upper border of the duodenal bulb, or even extensive deformity of the first and second parts of the duodenum are by no means infrequent in gall-bladder disease. I have seen looping of the duodenum, redundancy of the duodenum, fixation of the stomach over the whole lesser curvature to the gall-bladder region, gross dislocation of the stomach to the right, gross dislocation and fixation of the hepatic flexure of the colon to the gall-bladder, as well as extensive adhesion formation involving the whole right side. The commonest manifestation, however, is a defect of the duodenum in its first portion, usually involving the upper border and not infrequently making it difficult to differentiate from ulcer of the same region. An indirect finding of importance is spasm of the antrum and certain German observers, notably Waldeyer, have reported gastrospasm during biliary attacks. I have seen antrum spasm not infrequently. I have seen complete dislocation of the stomach in at least a half dozen instances and on one occasion, following an attack of gall-bladder colic, I was able to see a very marked spasm of the stomach resembling the picture of scirrhous carcinoma. Equally common are enlargement of the air chamber of the stomach, transient cardiospasm and frequent, persistent pylorospasm. It is, therefore, of importance in the absence of a definitely demonstrable defect in the upper digestive tract to explain the phenomena on the possible basis of a gall-bladder lesion.

Duodenal intubation as a means of investigation of the biliary tract has come to stay. This method cannot be replaced by any other method because there is no other means of examining more directly the nature of the bile obtained. To Einhorn we owe the essential practicability of duodenal intubation, and to my colleague (Lyon) we owe the suggestion of the possible separate collection of bile. He believes that he can obtain a gall-bladder bile as a distinct entity, a contention which has been the subject of much speculation. Brown, Smithies, Whipple, Sachs, Friedenwald, Synott, Levin, Niles, White and Gibbson have come out in favor of this interpretation. On the other hand, Einhorn, Bassler, Dunn and Connell, Crohn and his associates, Hartman from the Mayo Clinic, Fitz of Boston, Alvarez and others, seriously question the value of the deduction made tending to localize the nature of the bile obtained by duodenal intubation. In other words, there is a serious question as to whether the gall-bladder has a sufficient control power to act in such a way to the stimulants that it is possible to obtain diagnostic data from such separation. The material obtained from duodenal intubation is never pure bile. It is always a mixture of several different forms of secretion. Abroad the same situation prevails regarding the significance of cytologic, bacteriologic and chemical findings in bile after peptone stimulation.

Personally, I am of the opinion that it is not possible to obtain a pure sample of bile by duodenal intubation. Furthermore, it is impossible to disinfect any portion of the upper digestive tract. That it is possible to make separate fractions representing the ducts, the gall-bladder and the liver is probable, but that these fractions represent pure secretions is not a tenable theory. It is possible to obtain even in healthy individuals organisms which may come from the upper digestive or the lower digestive tract.

This does not detract, however, from the great significance of a careful study of duodenal bile for evidence of biliary pathology. I use the simple method of intubation followed by the introduction of the three sodas and two aspirations, and I still use this method of study for bile cases. I attempt to demonstrate, first, changes in the bile from normal, as to its microscopical, cytological and bacteriological aspect and appearance. Second, the important evidence of disease in the bile is the same evidence as that which is obtained in the urine, or the gastric contents,

or the spinal fluid, although the variations may be different. The variations are as follows: (1) A change in color, consistency and turbidity. If these are distinct and persistent, they are suggestive of alterations in the biliary tract. (2) An increased cell count varying all the way from a slight increase to a puree of leukocytes. (3) The presence of abnormal elements such as cholesterol crystals, which, I agree with Lyon, is a precalculus stage and at least occurs in individuals who are potential lithiasics. Observers like Chiray and Semelaigne pointed out the significance of clumping of crystals. I have, however, found cholesterol crystals in individuals in whom subsequent operation failed to demonstrate any sign of calculus. (4) The presence of other elements which are not usually encountered in the normal duodenal contents such as crystals of the amino acids, e. g., leucin and tyrosin, and also certainly colloidal elements. (5) The evidence of profuse epithelial exfoliation with clumping of leukocytes. On the other hand, I have obtained dirty bile and clumps of cholesterol crystals with no evidence at operation of the presence of stone. According to the studies of Fitz on the bile of removed gall bladders, the study of the cholesterol content and the nitrogen partition of the bile is of little value, the variations in known pathological conditions being so great as to preclude the possibility of diagnosis. Fitz is also of the opinion that cytological findings are of little value, but I believe and feel that duodenal intubation is at least one link in the chain of evidence for or against a diseased biliary tract. I hesitate, however, to assign an undue importance to the nature of epithelial elements and likewise to the nature of bacterial cultures. We were able to obtain both the colon bacillus and streptococcus from the culture of normal duodena.

In summing up the question of the diagnosis of gall-bladder disease, it is therefore well to bear in mind not only the nature of the history, the evidence on physical examination, the evidence which the x-ray studies demonstrate, but also the laboratory evidence which is offered by duodenal intubation. In the last year very interesting serum studies have been made for the early demonstration of obstructive jaundice. As yet no reference has occurred to these studies in American literature, but German, Australian and English literature points out the significance of the Vanden Bergh serum test and also the extraordinary significance of this finding regarding transient forms of jaundice. The examination of the movement for fat digestion and bile content, and the urine for bile pigments and salts, are naturally of importance and should be included in a complete summary of the case.

TREATMENT

In the treatment of gall-bladder disease the important conceptions are the following: first, gall-bladder disease with the exception of certain primary growths is a residual disease or the resultant of systemic or extravesicular forces rather than that of actual gall-bladder disease itself. In other words, the two great problems with which we have to deal, viz., infection and stone, are both due to conditions which are outside of the gall-bladder. After infection has localized in the gall-bladder, or after stone has been formed in the gall-bladder, it becomes a disease entity capable of producing a certain series of phenomena which the surgeon may be able to relieve or completely remove. The fact remains, however, that in many instances the removal of the organ does not remove the mechanisms which have brought about the condition. It therefore follows that whether or not the patient be operated upon and receive surgical intervention, he is a medical case first, last and all the time. It is as much a mistake to claim that there is no medical side to gall-bladder problems as it is to say that every gall-bladder case, regardless of its nature, should be submitted to the knife. If the gall-bladder is an integral part of the hepatointestinal circulation, then it follows that in very few instances does gall-bladder disease occur without some interference with this mechanism. Furthermore, we might say regarding the phenomena of infection that gall-bladder infections are secondary infections, secondary to primary infections in some other part of the body, and that the need of removal of the infected gall-bladder is an indication that another infection exists. This necessitates

immediately the search for a primary focus of infection along the well known lines for infection anywhere in the body. On the other hand, the surgeon can say, and with justice, that medical men have attempted to attach an undue importance to the bile changes, when in reality a chronic cholecystitis is an organic disease of the gall-bladder wall. Medical treatment of gall-bladder disease, therefore, is directed toward the removal of focal infections, toward the increasing of immunity toward the organisms which we know produce gall-bladder disease, toward the correction of hepatic function, which means the correction of gastroenteric function, and finally, toward the adequate distruction of the vicious cycle which results in gall-bladder disease.

In other words, we can sum up the measures at our disposal from the medical angle as follows: first, the removal of all focal infections or their correction. This includes the teeth, nose, throat, sinuses and upper respiratory tract. It includes just as imperatively the correction of gastrointestinal infections and urinary infections. This is no place for the discussion of these factors, but it is my rule in every case of gall-bladder disease to attempt to improve the patient's resistance toward the colon bacillus and the streptococcus.

Second, if Chauffard be right in his contention that cholesterol is increased in the circulating blood, it follows that we have in the diet a means for controlling the exogenous cholesterol intake. There are many foods which are rich in cholesterol, and one of the commonest is the ordinarily much cherished egg. In the French diet for this purpose, the diet is limited to cereals, vegetables, fruit and milk, and they insist upon skim milk, so that the fat is cut to a minimum. If it be true that fat is the food substance most intimately concerned with the biliary and hepatic mechanism, it follows that a low fat diet is the one indicated in gall-bladder disease. Furthermore, a comparatively low protein diet is desirable owing to the fact that in almost every case of gall-bladder disease there is some colon retention.

The third important point is the care of the digestive tract. Perhaps more than any other single factor the character of the portal blood determines the character of the bile, and the condition of the intestinal tract determines the condition of the portal blood. Practically all medical treatments directed toward gall-bladder disease have for their purpose thorough evacuation of the bowel. Water treatments such as the Carlsbad and Vichy cure act only indirectly on the gall-bladder through their effect upon the bowel. The use of the large number of cathartics and laxatives as well as the stronger waters is simply to insure a more thorough evacuation of the bowels. The assumption is that intestinal retention produces toxic substances which act upon the liver cell. Therefore, it follows that all measures from mild laxatives and cathartics to a diet which is laxative in nature, and even the thorough cleansing of the colon are measures which are indicated in gall-bladder disease, except of the acute variety. These measures result in an alteration of the portal blood, and therefore an improvement of the liver bile. My rule is to put the patient on a low fat, low protein diet and carry out measures destined to insure a daily complete evacuation of the bowels. Owing to the fact that in many of these cases there is dilatation of the cecum and retention, it may be necessary to carry out complete or recurrent irrigations of the bowel.

Of the medicinal measures which have been suggested most are supposed to be cholagogues. Ipecac and substances of that type are unpleasant, and it is questioned whether aloes, senna, colocynth, podophyllum and calomel have any primary cholagogue effect. Any claim regarding the effect of mineral waters on gall stones is now recognized by all of us as sheer nonsense. Schonger[18] questions the cholagogue effect of menthol, salicyl and salicylates. Sodium choleinate is a direct cholagogue, but is disagreeable in taste and an intestinal irritant. Cholactol is supposed to contain the active principles of sodium choleinate (peppermint oil) and according to this author has the same effect without the disagreeable taste and bedside effects. A combination of ox bile and urotropin as felamel has been used by Zahn.[19] He claims that it relieves pres-

sure colic in 2 to 3 days in cases of cholelithiasis and cholecystitis, and should be used with belladonna. Cologin is supposed to contain calomel, todothyllin and aromatics. Cramer[20] thinks that the best cholagogues are those found in ordinary foodstuffs such as peptone and suggests that it is unreasonable that drugs can act through their cholagogue effect alone. Probably the greatest effect in almost every instance is the laxative one. The proper form of treatment naturally is to aim to improve the condition of the liver cell, and in turn improve the nature of the bile form.

Another method of treatment of these cases is that of duodenal drainage. I have used duodenal drainage many thousands of times, but have always combined it with a Murphy drip and laxative substances in such a way as to act over a period of time. We have seen marked improvement in many instances by transduodenal lavage, and it is difficult to conceive of the removal of a small amount of bile as markedly improving gall-bladder disease. Certainly an infection of the gall-bladder wall cannot be changed in that way. On the other hand, it is logical to expect relief from biliary stasis. It is my belief, however, after more than seven years' experience with transduodenal lavage as well as a method of bile drainage which I described several years ago, that the action is precisely the same as the action of various laxative and mineral water cures, with the addition, however, of considerable psychic effect on the patient. By means of the duodenal tube it is possible to get into direct communication with the first part of the small bowel, and therefore to accomplish more direct treatment which is often urgent and of considerable value.

The question finally for discussion is that of surgical versus medical treatment. This is a problem which belongs more properly to the surgeon. There are several points, however, which I would like to make clear for the benefit of the medical men as well as for the surgeons.

(1) One ought always to be on guard for possible associated diseases of which the most common are chronic appendicitis, chronic colitis and chronic lesions of the stomach and duodenum.

(2) It is my rule to urge operation when medical treatment fails to produce amelioration of symptoms and a cessation of acute attacks.

(3) It is my rule to urge operation when there are gross deformities in the upper right quadrant, usually demonstrable by the x-ray.

(4) I am compelled to urge operation in the presence of acute inflammatory diseases under precisely the same condition that one would operate upon an acute appendicitis.

(5) In the presence of common duct block or in the presence of chronic gall-bladder disease at the malignancy age when the patient fails to register, after an appreciable period of medical treatment, any improvement, the physician is warranted in attempting surgery.

Medical men cannot cure a diffuse, chronic cholecystitis in which there is infection and infiltration of the gall-bladder wall. They cannot cure demonstrable gall stones. They cannot absorb adhesions between the gall-bladder and duodenum and the stomach, nor can they by any stretch of the imagination replace an altered topography due to an extensive lesion in the upper right quadrant.

On the other hand, the medical man can and does relieve low grade infections, biliary stasis, functional alterations of the digestive tract with unquestioned functional disturbances in the liver and gall-bladder. In many instances he makes a gall stone case entirely comfortable, and for years, in many instances, he succeeds in rendering an individual immune to further attacks which are unquestionably those of infection of the gall-bladder. As to whether the gall-bladder ought or ought not be removed, it is the author's opinion that if the gall-bladder wall shows unquestioned evidence of infection, it ought always be removed. No form of drainage succeeds in controlling a form of focal infection. But the surgeon who operates upon the gall-bladder simply operates upon the end-product of the forces producing gall-bladder disease. The rest of the hep-

atoenteric circulation is still intact and the deviations which have brought about the disease are still present. Therefore, it is urgently necessary for the medical profession to realize the necessity for some form of post-operative procedure in gall-bladder cases in precisely the same way that it realizes the post-operative ulcer cure.

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Discussion follows paper of Dr. Abell, page 86.

SURGICAL TREATMENT OF DISEASES OF THE GALL-BLADDER*

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The cases of gall-bladder disease requiring surgical treatment are neoplastic or infective in origin. The neoplasms observed in the gall-bladder have been believed to be chiefly of malignant character, although papilloma and adenoma are more frequently present than was formerly thought. The carcinomas, like deep-seated malignancy elsewhere, are insidious in onset and rarely come under observation at a stage that permits of radical removal. They are usually seen in gall-bladders which have been long the site of chronic infective and calculus irritation, and by the time symptoms of growth are superimposed upon those of chronic cholecystitis the involvement of adjacent and irremovable structures will limit their surgical treatment to palliative drainage or to diversion of bile into the intestine by adventitious routes. Cholecystectomy is to be undertaken only when the malignancy is limited to the gall-bladder, and since symptoms can rarely be correlated with the growth at this early stage, the discovery of the malignancy is incidental to operation undertaken for the relief of the cholecystitis.

In 394 operations done for calculus disease, carcinoma of the gall-bladder was observed four times, or in 1 per cent, while in 288 cholecystectomies done for chronic cholecystitis without calculi no such case was encountered.

Adenoma and papilloma are always observed in the course of a chronic cholecystitis, their growth being induced or excited by the chronic infective irritation. They are usually of minute size, occasionally involve a large amount of mucosa and rarely produce masses that fill the gall-bladder, demanding cholecystectomy, not only for their ablation but for the cure of the causative cholecystitis.

In the last 288 cholecystectomies done up to October 1, eight such tumors were noted, five edenomas and three papillary adenomas, a proportion of one to thirty-six. Seven of these were associated with the presence of calculi, while in one presenting a papillary adenoma filling the gall-bladder no stone was present. Only in the most exceptional instances can symptoms be attributed to their presence, the overshadowing picture being that of a cholecystitis.

The infective diseases of the gall-bladder depend upon bacterial attack for their activation, the pathways of entry being conceded to be the portal circulation and the blood stream with the possibility of entrance through the common duct, although the latter is a disputed point. The coincident widespread interlobular hepatitis seen in some cases gives rather firm ground for the belief that the portal cir-

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culation is the route of entry in such instances.

The trend of thought today is toward the acceptance of blood stream infection of the gall-bladder wall rather than an entry through its mucosa. The frequency with which such invasion follows in the course of focal infections; the degree and extent of pathology in the submucous coat of the organ; the fact that the fluid contents of chronically diseased gall-bladders only infrequently give growths upon culture as compared with the frequency with which such growths are obtained from the macerated wall; and the presence of simultaneous infections in the appendix, duodenum and stomach, point to the importance of this mode of entry. The experimental work of Rosenow adds further evidence to these clinical observations which together form a firm basis for the preference for cholecystectomy over cholecystostomy. The writer does not share the belief that the gall-bladder is a vestigial organ and may be dispensed with as readily as the appendix. Its function is not definitely known. It is thought by some to be a reservoir wherein bile is concentrated, stored and delivered under certain conditions, by others a tension bag which regulates the flow through the common duct. The fact that after cholecystectomy there is a compensatory dilatation of the extrahepatic biliary ducts would argue the possession of a definite function even though its exact character remains unknown. Experience has shown that its absence is compatible with health and biliary function, particularly when the extent of its disease has been such as seriously to impair the biliary and digestive tracts. I have observed instances where after cholecystectomy the reflex digestive symptoms attributed to the cholecystitis have been replaced by those indicative of disturbed pancreatic function, and since the latter came into existence only after the cholecystectomy I have been at a loss to know whether it was a result of pancreatitis which existed before the removal of the gall-bladder, or a sequel to the latter procedure.

For the purpose of discussion the infective disease of the gall-bladder may be divided into three pathological divisions: the acute, the chronic, and that in which the gall-bladder disease is but a part of the involvement of the biliary tract. Of 621 cases of gall-bladder disease considered in this series, 60 were classified as acute, 36 as subacute, and 525 as chronic. Of the 394 operated upon in which gall stones were present, 55, or 13.9 per cent, showed a definite pancreatitis at the time of operation as evidenced by increased size and density of the head of the organ, and 2 presented an acute hemorrhagic pancreatitis. Of the gall-bladder disease 44, or 7.08 per cent, showed coexistent common duct involvement. Forty-one had obstruction of the cystic duct and 14 obstruction of the common duct. Acute perforation of the gall-bladder with diffuse peritonitis was present in five cases, while gangrene of varying degrees involving the mucosa and underlying walls was repeatedly seen, usually protected by adherent intestine and omentum. Abscess of the liver was present in 5, and fistulous communication between the gall-bladder and some portion of the intestinal tract in 6.

The clinical pictures presented by gall-bladder infections may be divided into three groups. In the first will be found the acute inflammations, with or without empyema due to cystic duct obstruction, and accompanied by constitutional evidences of more or less marked type. The second group comprises those cases in which there are no acute symptoms, but which give a history of colics and which present reflex gastric disturbance. The cases of the third group give no history of colic or acute attacks and have as their chief complaint epigastric distress and disturbance of digestion. In the first group the indications for operation are obvious. In the second and third, the operability must be determined by the clinical history. The choice of operation will of necessity be determined by the local pathology and the general condition of the patient. The varying degrees and extent of the local inflammatory process, with and without the obstruction offered by the resultant stone formation and the often associated hepatitis, cholangitis, pancreatitis, myocarditis and nephritis, present a complicated and difficult problem.

The two important indications in gall-bladder surgery are the elimination of infection and the removal of obstruction, and while theoretically it may be possible to outline specific procedures for attaining such desiderata, it must be conceded that from a practical standpoint no hard and fast rule can be laid down. It is the writer's belief that any gall-bladder sufficiently diseased to demand operation should be removed, granted that local conditions and associated disease permit this without too great increase of the operative risk.

In most acute infections of the gall-bladder the presence of hepatitis and cholangitis and the technical difficulties and dangers of freeing an acutely inflamed organ from a bed of protecting adhesions make cholecystostomy a far safer procedure. The chief indication in such cases is the saving of life, the accomplishment of which means that one must be content with incomplete work so far as local pathology is concerned. The greater number of secondary operations follow cholecystostomies done under such circumstances, the persistence or recurrence of infection and the presence of overlooked or newly formed stones giving rise to a continuation or recurrence of symptoms.

When there is no evidence of associated disease in the liver, common duct or pancreas and the general condition of the patient permits, these cases, particularly those showing areas of gangrene, can often be dealt with by cholecystectomy, which surely affords a more thorough operation from the pathological standpoint. The presence of a large amount of inflammatory deposit in the gall-bladder wall not only introduces uncertainty as to its complete resolution if drained, but greatly adds to the difficulty of removal of calculi, smaller ones being overlooked. The presence of jaundice increases the risk, and if it is subsiding operation should be delayed. As a rule, cholecystostomy in the presence of jaundice is the safer procedure. Prolonged jaundice means pancreatic disease, common duct obstruction, or biliary cirrhosis, and in importance greatly overshadows any disease in the gall-bladder, the surgical treatment of which must be subordinated to that of the graver condition.

In chronic cholecystitis, accumulated experience has demonstrated that removal of the gall-bladder will give the largest percentage of permanent cures. Removal of stones and drainage by means of cholecystostomy secures cessation of colic, but will give but temporary relief from the reflex digestive disorder. The firm contraction of the gall-bladder wall upon stones or the converse, its long-continued distension due to cystic duct obstruction, render it functionless and make it a potential source of trouble if retained. In chronic cholecystitis, with or without stones, the thickening of the gall-bladder wall with the enlargement of the glands along the cystic and common ducts indicates a low grade, productive inflammatory process which not only gives rise to local discomfort and interferes with the function of the alimentary tract, but acts as a focus of infection with secondary destructive lesions of the pancreas, myocardium and kidney. The ablation of such a focus secures for the patient the greatest protection. The chronic pancreatitis seen with this class of cases most frequently disappears after cholecystectomy, and it is conceivable that with the removal of the focus of infection the compensatory dilatation of the extrahepatic biliary ducts following the operation accomplishes this by affording more adequate drainage.

In the group of cases in which the gall-bladder represents but a part of the disease of the biliary tract that procedure should be selected which best suits the individual case. With associated common duct stone, in the absence of acute septic cholangitis and prolonged jaundice it is usually safe to remove the gall-bladder, tubular drainage of the common duct being provided. With acute septic cholangitis and liver abscess, drainage is the all-important consideration and only the imperative operative trauma should be inflicted, utilizing the gall-bladder as a drainage site either alone or in conjunction with the common duct, and the patient should be considered fortunate if his recovery should demand and permit of a secondary operation. In non-calculus ob-

struction of the common duct, due either to stricture or to the passage of the duct through a densely fibrous pancreas, the gall-bladder, if of sufficient size, by means of a cholecysduodenostomy, can be used to obtain an unimpeded flow of bile into the intestine.

Prolonged jaundice greatly increases the risk of operation by interfering with the function of the liver and the kidney and by inducing hemorrhage, not alone from the operative wound, but from the mucosa as well. The study of the clotting time of the blood does not always give a true index of this liability, some patients, with a short clotting time, bleeding severely, while others with a long clotting time bleed little. The free drinking of alkaline water and the intravenous administration of calcium chlorid is a decided help, but the greatest protection is to be derived from blood transfusions made before the operation is undertaken, consequently before the onset of hemorrhage. Continuation of symptoms after operations on the biliary tract are due to persistence or recurrence of infection in the gall-bladder, liver, ducts and pancreas or to overlooked or newly formed stones. Eighteen of the 411 cholecystectomies in this series had previous cholecystostomies. Some of these had been done for cholecystitis without stones, most of them for cholecystitis with stones. It is interesting to note that in three of the cases primarily operated upon by me the stone formation existing at the second operation greatly exceeded that found at the first operation. Of 66 patients operated upon for common duct stone, 7 had a previous cholecystectomy. The great variation in the pathological anatomy afforded by the size, number and distribution of the stones and the degree and extent of the inflammatory edema and infiltration contribute greatly to the difficulty of making a complete removal. In 394 cases, the stones were found in the gall-bladder in 339, the common duct in 31, the hepatic duct in 1, and the entire tract in 23.

Regardless of the care exercised in the execution of gall-bladder operations and the thoroughness with which they are done, it will not be possible in each and every case to eliminate entirely the infection or to remove the total tissue change incidental thereto, and this group will show either no improvement or else relief will be incomplete. The best results are to be attained by proper preparation of the patient before operation, by performing as thorough an operation as his condition will permit, and by competent supervision and treatment afterward on the part of both surgeon and internist.

DISCUSSION—SYMPOSIUM ON GALL-BLADDER DISEASE

Papers of Dr. Rehfuss and Dr. Abell

Dr. W. A. Bryan, Nashville, Tenn.—We used to take a case of tuberculous peritonitis and operate and say, "Now you are well; you are cured," and then somebody would come in a year later and say that patient had died of pulmonary tuberculosis, and we would say, "That is too bad; I had him cured." So we cured ulcers of the stomach, and then we found we were not curing ulcers of the stomach, and today it has been emphasized that the same thing that caused the first ulcer—which may be cured—must be kept in mind by the physician, and, as Dr. Rehfuss said, such a case should be kept under the supervision of the physician to avoid a repetition of the trouble in the future.

Kocher said that gall stones belong to the patient and that it was the patient's privilege to keep them if he liked. I suppose that is so, provided the patient knows what he is keeping. The patients who have cancer of the gall-bladder are the patients who almost invariably have had gall stones. One man gave a report of 99 per cent gall stones; another says 100 per cent; another 98½ per cent, and so on. If a patient understands that by keeping these gall stones he may have cancer of the gall-bladder later on, he must not blame anyone but himself. I would be inclined to advise the patient to get rid of them.

We know that gall stones in the gall-bladder or in the cystic duct are more favorable for operation, that the mortality is less, and that the recovery better than if the gall stones are in the common duct. Sometimes gall stones pass from the cystic into the common duct, and this increases the risk to the patient and makes operation more difficult and recovery more uncertain.

A great deal has been said about whether you should do a removal of the gall-bladder, or drain it. Dr. Abell has properly stated the whole situation when he says that the object of the internist and of the surgeon is to save the life of the patient. We have had a great deal of fun in the past about the old phrase, "It was a beautiful operation, but the patient died." There has been some truth in that. A man undertakes to do a cholecystectomy when he knows the patient is not capable of tolerating it. When he knows the patient's condition he ought to pull him out of the water before he tries to dry him. When the pa-

tient recovers from an attack, then if a cholecystectomy is needed, he can do it.

Another thing was impressed upon me recently by a case I saw. Fortunately, I did not do it; I do not think I could. This patient had several major surgical conditions, and of these conditions gall stones was one. So that patient had a major surgical operation, a cholecystectomy, and then another major surgical operation. And the patient died in a little while. I think it would have been much better judgment—and I think this is a thing that needs to be driven home to us—to operate twice, i. e., give the patient a chance to recover from one operation before attempting another.

The cases that come back because they have not been cured have been referred to particularly by Dr. Abell. Nearly every man who has done gall bladder work to any extent has done a cholecystectomy where he subsequently regretted it, and has done gall-bladder drainage where he subsequently regretted it. We all feel that we know how to cure a certain number of these cases, but a certain number of gall-bladder cases will continue to give us trouble, no matter what we do—whether we do an 'ectomy, or whether we drain. But when we learn that the other fellow also is having trouble of that kind, it adds to our comfort.

The big thing that has been impressed upon me is that there is no longer a question of a fight between the internist and the surgeon. These two are getting together more and more, and will work together more and more to get the patient ready for operation, do the operation properly at the proper time, under proper conditions, and look after the patient properly when the operation is finished.

Dr. A. L. Levin, New Orleans, La.—Our improved or unimproved patients, medical or surgical, are our best witnesses, and from them we draw our conclusions as to what methods of treatment are best.

I am an enthusiast of the duodenal biliary drainage when properly done in the proper case. The question of whether the gall-bladder can be emptied or not, whether B bile can be obtained or not, is of scientific interest to me as well as to you. The battle is still raging, a No Man's Land is still existing, but the fact remains that my patients from whom I have drained what I call "600 W bile" two years ago are still enjoying good health and have not yet reached the surgical altar. Duodenal biliary drainage is unquestionably of great value as a diagnostic and therapeutic agent, but only as a useful link in a chain of evidence or repair. A careful history is still of great value. Laboratory evidences, such as gastric analyses, x-ray, stool examinations and duodenal biliary drainage, are of vital importance.

In the last few months I have been interested in the digestive hemoclasia test of Widal to determine the protein function of the liver. I believe this test will prove of great value to determine whether the origin of the infection is not from the liver side. The surgeon in this respect can be our guiding star. He handles the gall-bladders and can corroborate the value of this test. If the trouble is from the liver side we should start housecleaning from that end of it. The treatment then should be a corrected diet, cholesterin free, no acids, plenty of vegetables and fruits, plenty of water, small and frequent meals, alkalies are essential, and exercise. All of these help to keep the bile in a liquid state. Eliminate foci of infection wherever they may be. I believe hepatic extract influences liver function, as I have demonstrated by my table of observations. One should correct constipation.

These gall-bladder dogmas apply to the surgeon as well as to the internist. Recognize the condition early to prevent surgical interference. Do not depend upon drainage alone, nor upon cholecystectomy alone. Do not drain everything that comes along. Make the correct diagnosis first. Give to the surgeon what belongs to him—a chronic appendix, adhesions which interfere with the proper function of biliary drainage, empyema of the gall-bladder, etc.

One more point I wish to emphasize as strongly as I can, and that is the use of the tube without a metal tip, which I advocated two years ago, and the nasal route in preference to the oral. It is positively not essential to have a metal tip of any description, and the nasal route is more comfortable for the patient and less troublesome for the doctor.

These are my practical valuable points. Try them, and if found satisfactory adopt them. Make use of them also in your gastric analysis.

Dr. C. W. Dowden, Louisville, Ky.—It is necessary first of all that we recognize the fact that Dr. Rehfuss' very thorough and complete presentation deals with the medical aspect of gall-bladder pathology rather than the question of liver function. This being true, any discussion must hinge necessarily upon what evidence we are able to obtain from a complete history, thorough physical examination, and a cautious study of the bile obtained by the Meltzer-Lyon method.

At the Hot Springs meeting, a year ago, I presented the results of our findings in a rather exhaustive study of 100 cases. The work was carried out with an open mind. No attempt was made to confirm or discredit the procedure. A series of normals were studied at the same time, and we were unable to find sufficient difference in the gross appearance, microscopic and cultural study of the bile from the normal and abnormals, to look upon it as a very reliable diagnostic procedure. While reserving the right to change our opinion after further study along the same lines, we concluded at that time that nothing had surpassed in accuracy a complete history and thorough physical examination for the diagnosis of gall-bladder pathology. A study of several hundred cases since that time has further convinced us of this fact. Furthermore, we are quite in accord with Dr. Rehfuss, that it is absurd to attempt to cure an infected gall-bladder (where the infection is in the wall and the bile itself is usually sterile) by duodenal drainage. Such

cases are distinctly surgical. On the other hand, a considerable number of non-infectious gall-bladder conditions, depending possibly upon stasis and accompanied by such symptoms as jaundice, headache, "biliousness," etc., are quite promptly relieved by the simple procedure of drainage.

Our work with the hemoclastic digestive test of Widal was very disappointing and wholly at variance with the results of Dr. Levin. The same was true of our experience with the phenoltetrachlorphthalein test. Neither of these, however, belongs in the discussion of this subject.

Dr. Seale Harris, Birmingham, Ala.—There is a value in duodenal or biliary drainage. I have seen cases of gall-bladder infection in which there was marked improvement following its use, and in which the condition seemed to have improved to such an extent that there was no recurrence of symptoms. However, that at the same time we were using the so-called duodenal biliary drainage, we placed the patient on a low fat and low protein diet, and he was made to rest. I believe that the general management in gall-bladder cases contributes to a considerable extent to the good results of the treatment.

Others have spoken of the need for the medical man and the surgeon working together, and I believe this discussion will be helpful along that line.

Dr. Rehfuss and others called attention to the importance of removing focal infections in gall-bladder conditions. I should like to call attention to the importance of removing the gall-bladder as a focus of infection in lesions elsewhere. I am quite convinced that the gall-bladder is a frequent source of infection, resulting in nephritis, in arterial and heart disease, in which there is frequently high blood pressure. I had a case a few months ago, a patient who came to me and said he had Bright's disease and had been told that several times. Some one had also told him he had gall stones, but that he should not be operated upon on account of the condition of his kidneys. His blood pressure was not very high; his urine showed albumin and casts; and his general health was not good. I assured him that he could be operated upon, and that he must be operated upon. I put him to bed, used duodenal drainage, and at the same time put him on a low fat and low protein diet. He was very much improved, so much so that he insisted that he did not want to be operated upon. I told him that it was absolutely necessary; and so the gall stones and gall-bladder were removed. His blood pressure came down to 130; the albumin disappeared from the urine, and only a few hyalin casts remained.

As to the value of duodenal drainage in cases of that sort, just how long we can get results, I do not know; but this case is interesting and suggestive. A few weeks ago a surgeon referred to me a case, a business man of Birmingham, who had a blood pressure of 210, with albumin and casts in his urine. Two or three days after the man was placed under my care he had an attack of acute pain, so intense that he had to have hypodermics of morphine. I told him I thought he had gall stones and that it was my opinion that he should be operated upon. He said that he could not spare the time for operation then, that he had a lot of money invested in a way that required his attention, and asked that if possible I should defer the operation for a time. He had albumin and casts in the urine; and he had some elevation of temperature—101 or 102°. But after two or three days of rest, drainage and diet his temperature subsided, the tenderness disappeared, the blood pressure went down from 210 to 150, and for the past two or three weeks has remained about the same. If this man has any more symptoms I shall insist upon his having his gall-bladder removed; and if he has gall stones they will come out with it.

The question of diet plays an enormous part in the production of gall stones and gall-bladder affections as well as in the prevention of recurring symptoms after the operation. I think one of the most important articles that has been contributed to medical literature is that by McGarrison, of the British Army, who experimented upon monkeys in the Himalayas, feeding them with autoclaved rice, or a sterile diet. He found that nearly all of these laboratory animals developed intestinal infection. At autopsy he made sections of the intestines and they showed gross lesions of the intestinal tract. The sections showed the bacteria going directly from the intestinal tract into the circulation. So it seems to be that a localized colitis is frequently a source of infection itself. In other words, it is a source of focal infection. In that way the liver and the gall-bladder becomes diseased, the infection coming from the intestinal tract.

I do not know whether gall-bladder disease or gall stones are increasing, but with our modern methods of living, with a diet of white bread and muscle cuts of meat, and with the experiments that have been made showing that all sorts of changes, for instance in the teeth, can be brought about by feeding animals on variations in diet, with all this I am convinced that the diet that we employ generally over the country is having much to do with what we believe to be an increase of gall-bladder disease. When the public is educated along this line I feel we shall have less of intestinal and gall-bladder infections.

Without doubt the internist can be very helpful in making an accurate diagnosis and in preparing the patient for the operation; and after the operation he can help immensely by placing the patient in better condition to reduce the chances of infection. Furthermore, the patient must be informed that if he expects to keep quite well and not have a recurrence of gall-bladder disease or biliary disease, he must be on a low fat and a low protein diet for a year and perhaps several years.

Dr. Rehfuss (closing).—I cannot see how a discussion of gall-bladder disease is possible without consideration of the mechanism by which gall-bladder disease takes place. In other words, the biggest point in the whole situation is the fact that gall-bladder disease is the result of a series of infections and mechanical disturbances of the

lower intestinal tract. The final, end result is what we see.

Dr. Levin called attention to hemoclasia, which is a test devised to throw light upon different functions. He said there was not much about it in the literature. There have been perhaps twenty articles upon this subject in foreign journals, but not much in this country. The purport of these articles has been lack of specificity of this test. Two years ago before the New York Academy of Medicine Dr. Thomas R. Brown said he had personally been much interested to know whether it was a specific test, but he had not gotten very far with the test. Less than 70 per cent were positive. The question is unsettled, and I should hesitate to make a statement from the foreign literature as it stands today. One German report has actually claimed that there is a leukopenia following the use of dextrin. In several articles the variation of leukocytes and leukopenia is considerable.

I think Dr. Harris made a statement that to my mind is extremely important, and that is that the gall-bladder is the seat of focal infection. I have twelve cases of nephritis under my care at the present moment with digestive manifestations and evidence of infection of the intestinal tract and gall-bladder. I have also a series of cases which I have seen with Dr. Patterson, of Philadelphia, in which cardiac manifestations are unquestionably associated with disturbance of the biliary tract, probably brought about by infection of the upper intestinal tract.

As to drainage, I have done that many thousands of times. You will find two articles of mine written in 1918 speaking of transduodenal lavage and drainage. The point about it is this: We have a number of cases, perhaps 100, that we have diagnosed probable gall stones from other findings, some x-ray findings, that are perfectly quiet; and we have a number of cases that are perfectly quiet that have received no other form of treatment. To me that is not scientific evidence. It is not scientific evidence to say that a man who has gall stones should live on a careful diet, and that because he lives under this careful diet the method is good. That does not prove anything. You must take a group of 100 cases and treat them one way, and then treat them another way, to prove they are similar cases. We have a number of cases of gall-bladder disease that stay well and they do not come to us until they have an attack. The evidence in an impartial court of justice is by no means complete regarding the value of duodenal drainage. The main point I wish to make is that there are arguments both ways. I have seen magnificent results from duodenal drainage, but I would hesitate to say what is the exact status of this method of therapeusis.

Regarding the tip, you know we all have our own personal likes and dislikes. I used twelve different tubes before I decided upon what I thought was the best. I am perfectly sure that nature did not intend the nostril to be used as a passage for a stomach tube or for swallowing anything. But Dr. Levin gets his results that way, and we get ours another way. One thing we do know, and that is that all the medical papers point to the necessity of placing the tube in the right direction and in the right position. Today we realize the necessity of combining fluoroscopy and intubation at the same time. Unless you have something on the end you cannot place the tube properly. I have made 2,500 examinations a year for several years, and a reasonable proportion was with the tube in place; and we cannot place a tube without a tip by means of the fluoroscope.

All I have to say is that I do not think the medical man controls the situation in regard to gall-bladder disease, and I do not think the surgeon controls it. If the evidence is clean cut, if the infection gets under the mucous membrane with infiltration of the wall, no method of local treatment can touch it any more than a cathartic will cure an infected appendix. These people quiet down because their resistance is increased But I want you to realize that these are only my own personal opinions regarding this matter.

MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

A REPORT OF 3080 CASES OF MEASLES WITH SPECIAL REFERENCE TO PNEUMONIA*†

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HISTORICAL

Measles is an extremely prevalent communicable epidemic disease characterized by fever, coryza, cough, conjunctivitis, and a typical rash. In such manner can we epitomize a disease unfortunately looked upon by doctors and laymen as a disease which every child must get, a disease whose complications are few, whose mortality is low, and a disease which is commonly regarded as mild and easily cured. In this paper it is our intention to contradict these beliefs and to emphasize the fact that especially in institutions for infants and young children no epidemic disease is more to be dreaded than measles, not only on account of its toxicity, but from the frequency with which it is complicated by broncho- and lobar pneumonia. As a cause of death it ranks first among the acute fevers of children, the death rate being highest under 2 years of age.

The liability to infection in measles is a recognized fact. It is almost universal in persons unprotected by a previous attack. Those peoples who have not inherited a partial immunity which might cause an attenuation of the virus of measles are peculiarly liable to it, and the mortality among them is exceedingly high, as was evidenced by the epidemics in the Fiji and the Faroe Islands. It was imported in 1875 from Sydney by H. M. S. Dido to the Fiji Islands, and 40,000 out of 150,000 of the inhabitants died in four months. There will also be brought to mind the widespread and fatal epidemic which decimated the inhabitants of the Faroe Islands in 1846, and more lately our experiences during the great war in army cantonments, where measles in epidemic form proved a great scourge.

INCIDENCE OF MEASLES

The number of cases of measles in our series were from 1919 to October 1, 1922, as follows:

	CASES TERMINATED			
Sex	1919	1920	1921	1922
Male	284	508	188	620
Female	228	495	190	565

The proportion will be seen to be about equal.

Age				
Under 6 months	4	19	6	20
6 to 12 months	44	69	16	97
1 to 2 years	140	256	84	885
3 to 5 years	141	340	122	370
6 to 10 years	78	199	87	197
11 to 15 years	11	25	7	13
16 to 20 years	12	27	15	34
21 years and over	53	57	35	61
Not reported	29	13	6	8
	512	1005	378	1185

The greatest incidence of measles, therefore, will be seen to be between the first and the fifth year, being 2113, or 68.65 per cent, of all our cases.

ADULT MEASLES

This occurred in our series of 3080 cases 350 times, or about 9 per cent of the total. It is naturally less virulent than infantile measles, owing to the gradually acquired immunity which comes with advancing years and environment. Incidentally, of those adults exposed to measles the greatest morbidity and mortality occurred in country-bred adults. This was proven time and time again in army cantonments during the recent war. Pneumonia was a complication in these cases of adult measles 13 times, or 3.7 per cent, the more common type being bronchopneumonia. In all we had 9 cases of bronchopneumonia, and 4 of lobar pneumonia, a percentage of 69.2 for the broncho type as compared to 30.8 per cent for the lobar type.

*From the Willard-Parker Hospital, New York City.

†Read in Section on Pediatrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

INFANTILE MEASLES IN PRIVATE AND HOSPITAL PRACTICE

When one compares cases of measles in private practice to those seen in the hospital, one is struck by three things: first, they are less sick; second, the incidence of pneumonia and other complications is less; and third, the mortality resulting from the pneumonia is much less in private than it is in hospital practice. Just what are the reasons for these facts? Our statistics show them to be as follows: in private practice the children are well fed. They are seen from the onset of the disease. They obtain competent medical and nursing care. Their housing is better, and their general resistance is much greater to the disease. In the hospital cases the children are under-nourished, poorly housed and living in crowded, dirty surroundings. They consequently have poorer resistance to disease. They are not seen from the onset, as is shown by the fact that they come to the hospital with a well developed pneumonia. Many of them have tuberculous tendencies. A great number are referred to us from other hospitals, having been previously ill with some other primary disease than measles. The individual nursing care is less intensive owing to the number of sick children per nurse. For these reasons the hospital case suffers by comparison.

TYPES OF MEASLES PNEUMONIA

The two common types in order of occurrence are bronchopneumonia (capillary bronchitis) and lobar pneumonia. Objectively bronchopneumonia is recognized by a rise in temperature to 104° or higher, rapid breathing, dyspnea, and increasing unrest. The diagnosis is established by physical examination of the chest. Frequently the disease is bilateral, and the area of pneumonia is difficult to localize, especially when it is centrally situated. Small foci can readily be overlooked, especially where there is an intensive bronchitis of the smaller bronchi. A spreading bronchopneumonia in the course of measles is a very unfavorable complication. Those cases which recover frequently require several weeks before the dullness on percussion over the consolidated areas disappears. This has been termed "asthenic pneumonia" and it raises the question of a possible tuberculous infiltration, from which it can be differentiated only by its future course. Those persons, however, who have latent tuberculosis, particularly of the bronchial lymph nodes, may develop a more or less widespread tuberculosis. In children it is usually of the miliary type following the pneumonia of measles.

Lobar pneumonia is usually regarded as a rare complication of measles. The fact that our series showed 49 cases of lobar pneumonia out of a total of 826 cases of pneumonia would tend to contradict the impression given by the literature.

AUTOPSY FINDINGS IN MEASLES PNEUMONIA

Lobar Pneumonia.—In 4 cases reported in detail there was red hepatization in 1 case, gray hepatization in 3 cases, and the consolidation was firm and coarsely granular on section. Two of these cases were associated with purulent bronchitis in parts of the lungs that had not undergone consolidation, whereas in the 2 other instances there was acute bronchitis and peri-bronchiolar pneumonia only recognized by microscopic examination.

Bronchopneumonia.—The characteristic picture at autopsy in bronchopneumonia following measles is very similar to that found after an influenzal bronchopneumonia. In some cases there is found hemorrhagic peribronchiolar consolidation characterized by the presence of small gray spots clustered about terminal bronchi upon a homogeneously red background. In other cases peribronchiolar patches of consolidation with no surrounding hemorrhage were found, the majority being recognized with difficulty and only by microscopic examination. Lobular consolidation is quite common and peribronchial fibrinous pneumonia is present in at least one-third of all autopsies.

Unresolved Pneumonia.—The incidence of unresolved bronchopneumonia in instances of bronchopneumonia following measles is very high, being over 30 per cent. The essential features of this chronic lesion are either (a) a chronic peribronchiolar pneumonia; (b) chronic peribronchial inflammation; (c) chronic lobular inflammation; or (d) moderate thickening of the interlobular septa.

Suppurative Pneumonia.—Suppurative pneumonia with abscess formation is not common and usually follows a chronic bronchopneumonia. The usual autopsy findings are a consolidation of part or all of a lobe which shows on section a cloudy grayish red color. Inside this area of consolidation and below the pleural surface there are seen yellow opaque spots of necrosis.

Very unfortunately, at the Willard-Parker Hospital we have only a limited number of autopsies, so that the preceding findings are founded on a series of army autopsies.

FREQUENCY OF PNEUMONIA IN MEASLES

Pneumonia is the most severe complication of measles, varying from year to year in frequency and severity. Small reports, in a measles epidemic developing at Camp Pike, 65 cases of pneumonia occurring in 867 cases of measles, or 6.4 per cent. There were 8 cases of lobar, 48 cases of bronchopneumonia and 9 cases of streptococcus pneumonia. Seventeen cases died, showing a mortality rate of 30.4 per cent for the group. Five of these fatal cases occurred among the 9 streptococcus pneumonia. The mortality rate for the streptococcus pneumonia thus was 55.4 per cent, and that for the non-streptococcus, 25.5 per cent. All 9 cases of streptococcus pneumonia developed empyema, and no cases of empyema developed in the group of non-streptococcus pneumonias. As our patients' throats were not cultured, we can give no definite opinion on this point. It is well to keep in mind, however, the cases of empyema developing after a streptococcus infection.

Our pneumonia cases were divided into those which had the disease on admission and those developing it in the Hospital.

PNEUMONIAS

	1919	1920	1921	1922
Developed on Admission				
Lobar	11	4	3	8
Broncho	37	96	61	288
Developed After Admission				
Lobar	12	3	4	4
Broncho	33	111	23	128
Total	93	214	91	428

This makes a total of 826 cases of pneumonia, or roughly a percentage of 26.8, or over 4 times Small's figures.

Holt, in a series of 300 institutional cases, all under 3 years of age, records bronchopneumonia in 40 per cent of the cases. Of these 120 cases, 84, or 70 per cent, died. Of 2477 cases, including several epidemics of measles among children of all ages, pneumonia occurred in 10 per cent. It is our general contention that in every fatal case there will be found pneumonia in varying amounts.

Henoch's figures are a bit higher than Holt's and show 56 per cent of pneumonia cases following measles in various institutions.

MORTALITY OF PNEUMONIA CASES

Our findings were as follows:

1919	1920	1921	1922
64.15%	56.67%	32.36%	49.76%

This is an average during the past four years of 50.75 per cent. On the other hand, in 300 collected cases of measles in private practice pneumonia occurred in but 25 cases. The mortality of this group among children of the better classes was exceedingly low, being 4 per cent.

DURATION OF PNEUMONIAS

In the majority of cases where pneumonia developed, it made its appearance during the second week of measles, and where death occurred it took place during the third week. This fact is borne out by other observers, the percentage of second week pneumonias being approximately 70. The duration of pneumonia varies from 3 to 30 days. It did not exceed 1 week in 65 per cent of the cases. When the duration of pneumonia exceeded 10 days, some evidence of chronic pulmonary disease was found at autopsy.

MORTALITY FROM MEASLES

MORTALITY BY AGE

	1919	1920	1921	1922
Under 6 months	0	6	1	8
7 to 12 months	18	20	6	37
1 to 2 years	33	72	18	114
3 to 5 years	5	16	4	42
6 to 10 years	4	2	3	10
11 to 15 years	0	0	1	0
16 to 21 years	0	0	0	0
Over 21 years	0	1	1	2
Total	60	117	34	213

The greatest mortality is shown to be from 7 months of age to 2 years, there being 308 deaths out of a total mortality of 424, or a percentage of 72.6 during that period.

MORTALITY BY TIME IN HOSPITAL

24 hours and under	10	13	11	12
48 hours and under	5	10	2	7
Over 48 hours	45	94	21	194
Total	60	117	34	213

DEATHS FROM CAUSES OTHER THAN PNEUMONIA

1919—Marasmus	2		
Tuberculous meningitis	1		
Gangrenous stomatitis	1	—	4
1920—Sepsis	6		
Tuberculous meningitis	3		
Diphtheria	4		
Empyema	2		
Marasmus	1	—	16
1921—Empyema	1		
Myocarditis	1	—	2
1922—Marasmus	7		
Empyema	2		
Mastoiditis	2		
Diphtheria	8		
Sepsis	6		
Tuberculous meningitis	3		
Empyema	1		
Myocarditis	1	—	30
Grand total			52

All other deaths were due to pneumonia.

SEQUELAE OF PNEUMONIA

The most common sequela of a measles pneumonia is tuberculosis. This usually means that in a child with latent or primary tuberculosis, measles markedly predisposes towards secondary tuberculosis. This may appear as a general miliary tuberculosis, or as secondary tuberculosis of some organ. In particular, tuberculosis of the joints for some reason is prone to follow attacks of measles. The organ which is most commonly affected by tuberculosis is, of course, the lungs. This follows a broncho- or a lobar pneumonia and its most common form is tuberculous bronchopneumonia. Unfortunately we have no follow-up system to ascertain exactly the number of cases developing tuberculosis. The prognosis of tuberculosis following measles is, of course, comparatively grave. Empyema is another sequela of pneumonia and is regarded by many writers as very rare. This, however, appears in our series more frequently than the literature would lead one to expect.

The number of empyemas and tuberculosis cases were:

	1919	1920	1921	1922	Total
Empyema	3	6	2	11	22
Pulmonary tuberculosis	1	3	1	3	8

This makes a percentage of 2.56 cases of empyema and a trifle less than 1 per cent of pulmonary tuberculosis.

PROGNOSIS OF MEASLES PNEUMONIA

This will depend upon the age of the patient, his previous condition, the season of the year, and the severity of the epidemic. In determining the prognosis in any one individual case the temperature and the character of the eruption must be considered. An initial temperature of 104° or higher, or a temperature that continues high until the eruption appears, is a bad symptom. The mortality is directly proportionate to the height of the temperature, the death rate in one series of 30 cases with the highest temperature, 106° or over, being 84 per cent. A temperature that does not fall as the rash appears, or which rises after the rash fades, is also a bad prognostic sign. It is an unfavorable sign for the eruption to be delayed, to be very faint, scanty, hemorrhagic, or to disappear suddenly. This is usually due to weak heart action. A pneumonia which runs a high temperature, and one which does not readily resolve, should also be regarded as unfavorable and as possibly pointing toward a tuberculous condition.

TREATMENT OF PNEUMONIA IN MEASLES

Our treatment of pneumonia at the Willard-Parker Hospital approximates very closely the treatment of a broncho- or lobar pneumonia not complicating measles. In general, all our patients are put out upon an open veranda receiving a maximum of cold fresh air. If they are kept indoors the windows are kept open and the patient is protected from drafts. Diet of course varies with the age of the patient, water is always forced by mouth and we depend to a large extent upon milk and its modifications, broths, eggs, gruels and cocoa. Ice cream will prove of value especially in children who are difficult feeders. Alcohol internally is seldom used by us, as we feel that we can get better stimulation by means of hydrotherapy. Here we use alcohol and water sponges, cold packs or compresses, and occasionally cool baths at 85 to 70° F. The cold baths are especially useful in children when preceded by a mustard bath where there is high fever, delirium or stupor, circulatory failure or severe toxemia.

Local applications are seldom used by us unless there is severe pain on breathing. Dry cupping and poultices have been discarded. We use very few drugs. It is seldom that we use expectorants, as they have a tendency to upset the stomach.

For severe cough, inhalations of compound tincture of benzoin with the windows kept closed may be tried. Codein is of value (¼ to ½ a grain) in controlling very irritating coughs. Strychnin, especially when given hypodermatically, is of value as an aid to the respiratory center and to the circulation. In general, however, few drugs are needed. To dry up secretions where there is a persistence of the signs with many moist rales, atropin sulphate in doses as high as 1/40 of a grain per diem may be found of value.

SUMMARY AND CONCLUSIONS

(1) We report a series of 3080 cases of measles.

(2) In our series of 3080 cases of measles, pneumonia, bronchial and lobar, occurred in 826, a percentage of 26.8. In other words, 1 out of every 4 cases of measles either had pneumonia on admission to the hospital or developed it during the course of the disease.

(3) Of the 826 cases of pneumonia, 424 died, 51.33 per cent.

(4) The number of deaths from all causes was 476, so we see that 89.20 per cent of all the deaths in measles were due to pneumonia.

(5) What can be done to prevent the occurrence of pneumonia in measles? This is a very difficult problem to solve. Over half of our cases are transferred from other hospitals, when measles becomes secondary to some other previously existing condition. The greater part of the remainder come from the overcrowded sections where the children are usually undernourished with a consequent diminished resistance.

With these overwhelming odds against us in the hospital care of measles, the only recourse left is to advocate the prevention of overcrowding and to inaugurate more intensive nursing care, which unfortunately is not possible in New York at the present writing.

In smaller communities we would advocate home care rather than hospital care, especially where the environment is good. This automatically lessens the dangers of secondary or cross infections. It is obvious, therefore, that until we procure more utopian surroundings, measles and its complications will remain one of the chiefs of the captains of the men of death.

ON DERMATOLOGY*

By William Allen Pusey, M.D.,
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I have a predilection for making, now and again, an appraisal of the worth of the things to which I give my efforts, and that disposition appeared in me as I thought of this occasion. Is the field in which you and I are engaged one of the large and important departments of medicine? Is dermatology a worth-while vocation for men who want to devote their lives to serious and useful endeavor? And, if so, how should it be pursued? Such questions, I think, occur to thoughtful men in every occupation, and it seems to me appropriate to ask ourselves such questions on an occasion like this, when we are promoting a movement for the improvement of our specialty.

I shall answer in the affirmative the question "Is dermatology a worth-while specialty?" and in doing so I shall avail myself of the opportunity of marshaling some of the reasons for the faith that is in me.

The first evidence of dermatology's capacity is its vitality. Dealing with diseases which for the most part do not involve life and death, many of which are to be classified as unimportant, dermatology has shown a vigorous and uninterrupted growth now for more than a century. Modern dermatology may be said to have taken its beginning among a few pioneers in France and England in the early part of the Nineteenth Century, among men like Willan, and Bateman, and Plumbe, in London; and Alibert, Rayer and Cazenove, in Paris. Following these early disciples of dermatology, there was a rapid growth in the second quarter of the Nineteenth Century until, about the middle of the century, there was a fine band of men scattered all over Europe who were developing the subject of skin diseases under such leaders as Hebra, in Vienna, Bazin and Hardy, in Paris, and Erasmus Wilson, in London. Modern knowledge of syphilis had begun under Ricord, in Paris, in 1837,

*Read in Organization Meeting of Section on Dermatology and Syphilology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

when he had undone, by establishing the duality of syphilis and gonorrhea, the mischief which John Hunter had caused fifty years before, and which had retarded the development of syphilology for that half century. Worthy comrades of his in beginning our modern syphilology were Rollet and Bassereau and Clerc, in France, and Wallace, of Dublin.

These men founded modern dermatology and syphilology. Following them came a great generation of dermatologists, led by such men as Jonathan Hutchinson and Tilbury Fox, in England; Fournier and Vidal, in France; and Neuman and Kaposi, in Vienna. These pioneers in dermatology were real men, men in the very forefront of medicine in its greatest centers. Hebra, in Vienna; Fournier, in Paris; Erasmus Wilson and Jonathan Hutchinson, in London, are among the great names in clinical medicine of the Nineteenth Century. Hebra in his day stood out as the greatest teacher, and perhaps the greatest medical man, in Vienna in a group that included such masters as Skoda, Rokitansky, Hyrtle and Sigmund. On Fournier, in Paris, fell the mantle of Ricord at the St. Louis Hospital. His and Ricord's are probably the two greatest names in the clinical history of syphilis. Erasmus Wilson was the brilliant versatile leader in London in the middle of the Nineteenth Century, and Jonathan Hutchinson, with Sir James Padgett, was one of the great clinicians who brought down to the time of men now living the fine traditions that have given honor to English medicine from the days of Sydenham. Men like these found in skin diseases a subject worthy of their intellects.

These men of the third quarter of the Nineteenth Century established our modern specialty. They broke down for it, among the earliest of the specialties, the barriers which prejudice had erected against specialism in general. They made it a specialty which could not be ignored, and their followers have grown into a large and important body in every nation of culture.

American dermatology had its start in a few pupils of these great European masters of the middle of the Nineteenth Century. Most of them got the impulse to dermatology from Hebra's clinic in Vienna. Specialism did not take very early root in the United States, but dermatology was among the early ones. Many of us remember most of our pioneer dermatologists. I count it my good fortune to have known many of the first men who practiced dermatology as a specialty in the United States. J. C. White, and after him Wigglesworth in the sixties, were the pioneers in Boston. Henry D. Bulkley and Fanueil D. Weisse, who was a pupil of Erasmus Wilson, began dermatology in New York in the sixties. Quickly following them was that group some of whom did so much for American dermatology, including Freeman J. Bumstead, William H. Draper, Morris H. Henry, and, only somewhat younger, George Henry Fox, Keyes, Taylor, Piffard, L. D. Bulkley, Heitzman, and Bronson. This group, largely under the urging of Weisse, founded in 1869 the New York Dermatological Society, which is the oldest dermatological society in the world. In Philadelphia the pioneers were Duhring and Van Harlingen; in Chicago, Hyde; in St. Louis, Hardaway. These men were the founders of American dermatology. And yet, how modern do their names sound to us! When one thinks of this small group of fifty years ago and less, it impresses upon one the rapidity of growth of our specialty. Our greatest growth in numbers has occurred in the last fifteen years. Indeed, I know nothing testifying more strongly to the interest and strength and vitality of dermatology than the way in which younger dermatologists of training and skill have been scattering themselves over the entire country within the last few years. If the law of sociology, that those who multiply most abundantly will prevail in the earth, applies to dermatology, dermatology will, if it keeps up its pace of the last few years, become one of the dominating specialties of medicine.

The growth of dermatology and the increase in the ranks of dermatologists are testimony to the inherent interest of the subject; for dermatologists, unlike the surgeons, and laryngologists, and ophthalmologists, do not wear furs and ride in limousines. We have not the sort of specialty that leads to opprobrious opulence. Men

are attracted to it largely by its intrinsic interest; and in this, dermatology yields to no other specialty. As is so often said, ours is the only specialty in which nearly all pathological processes can be studied under natural conditions in the living. The processes on inflammation, of infection, of malignant growths, in all of their details and in all of their ramifications, can be studied in life only in diseases of the skin. This has resulted in an enormous accumulation of clinical observations in diseases of the skin, and in refinement in the distinctions between pathological processes in the skin, which is more elaborate than exists in any other specialty. And by the thoughtless this is used as a reflection upon us. But it is no fault of ours that we have observed more facts in our specialty than have been observed in some others, and that, having observed these facts, we have named them, for facts to be used must have names. Undoubtedly the elaborate distinctions that we have erected will be followed in time by condensation into smaller groups. But elaboration of details must come before broad generalization. What we have been accumulating are the facts that the Darwins of the future will simplify by grand generalization. It is none the less to our credit that we have furnished the stones for some of the future temples.

At the present time dermatology can claim that its field has been thoroughly traversed and its details studied and recorded. We have plenty of problems still unsolved, but in this we stand a full brother to all of the other departments of medicine.

In offering to medicine a thoroughly studied and a fairly well systematized set of observations covering all manifestations of pathological processes in the skin, we are offering a set of observations that have a bearing upon diseases in general and that are potentially of value in the study of every pathological process that effects human tissues. The potential fruitfulness of skin diseases in the solution of problems of diseases in general is illustrated well in the beginnings of bacteriology. In 1837, Schwann showed that yeasts, found in fermenting substances, were living organisms which were the cause of fermentation. Within two years Schonlein demonstrated that disease was produced by an organism when he discovered that favus was caused by an organism. Between 1839 and 1844 Gruber showed that ringworm and thrush were due to organisms, and in 1846 Eichstedt added another disease due to an organism by discovering the organism of tinea versicolor. Thus the centuries-long contention that a contagium vivum might be a cause of disease was settled in the affirmative by the demonstration of organisms producing diseases of the skin, and the science of bacteriology was founded.

It cannot be said that the potential values of dermatology in the elucidation of diseases in general have had extensive application as yet, but such applications are slow. The great fact is that these potential values exist. That the facts of dermatology will more and more be utilized in the elucidation of the problems of pathology in general will surely follow, as they become more widely known and are more widely studied in their bearing upon the problems of general medicine.

It is in this field of the application of the knowledge of disease processes as they are observable in the skin, in solving the problems of disease in general, that dermatology has its most interesting outlook upon the future.

As for us who are in the midst of dermatological practice today, I think we can congratulate ourselves that fortune has treated us with unusual favor. We have seen in the last twenty years an enormous enlargement in the importance of dermatology. I have been in dermatology for only half a short lifetime, but it is hard to realize the changes that have occurred in dermatological practice within my experience. The biggest single change has been in the knowledge of syphilis, and the greatest additions that have been made to our means of treatment have been through the applications of radiant energy. With x-rays and radium and ultra violet light we may claim to have made additions to our knowledge of therapeutics that have been applicable to diseases beyond the skin in a way which illustrates the potential values of dermatology to medicine in general which I have referred to above.

For the wide therapeutic application of x-rays and radium and ultra violet light has followed the knowledge that was acquired first in the application of these agents to pathological processes in the skin. And we in dermatology led in that work. We first showed by their application in skin diseases the therapeutic possibilities of these agents. And we have continued to lead in the solid progress of knowledge in radio therapy. We have fostered intelligent progress in their general therapeutic use by showing what could be done with them with intelligent use in the skin; indeed, we may claim almost to have saved them from disaster when the use of these agents in other fields, and in skin diseases by men who did not know the diseases they were treating, seemed at times to be hopelessly discrediting them.

The application of physical therapy to the treatment of skin diseases—of x-rays and radium, Finsen light, refrigeration, and the electrical destruction of tissues and other physical agents yet to be employed give promise of great enlargement of the field that the dermatologist is coming to occupy.

Considerations of this sort make me believe that dermatology is a thoroughly worth-while specialty; that its problems are as big as the problems of medicine in general; that they are worthy of the attention of any intellect; that you and I shall never be troubled like Alexander was by the fact that there are no more worlds for us to conquer. We will never be subject to the danger of finding our field too small for our continued intensive study. On the contrary, the trouble is that dermatology is too big for any of us. We cannot know all of internal medicine, or neurology, or physiological, or pathological chemistry, or bacteriology or physics, and until we know all of these, and more, we cannot have all of the training that there is need of for the solution of the problems of skin diseases. I think, then, that we may feel justified in the conviction that we have a worth-while specialty, and one that is entitled to our best efforts as long as we are capable of effort.

The next question that I raised is how can we, jointly and individually, best cultivate our specialty. I shall not attempt to elaborate in detail what a training in dermatology should be. We have all thought upon that subject; we have all had a more or less adequate training, and we all know how we would improve upon our experience if we had the years to go over again. And lately, too, the dermatological sub-committee of the Committee on Post-Graduate Training of the Council on Medical Education of the American Medical Association has suggested a plan of preliminary training in dermatology, which is a suggestive outline of how we should continue to develop ourselves after we have passed the period of preliminary training.

But I believe it is particularly appropriate on this occasion to call attention to the continuous development of the practitioner of dermatology in his specialty which comes from the association with his colleagues in dermatological organizations. One can speak best from his own experience. For that reason I refer to my own. From time to time I have tried to evaluate the parts of my experience that have seemed to be the most useful. I think perhaps the greatest development of all of us comes from the stimulus of the study of one's own cases in private and public practice. It is no new conviction of mine that, after that, the best part of my development in dermatology has come from the knowledge and the stimulation that I have gotten from association with my colleagues in our various societies. I think it must be a dull man who can come away from a meeting of men who are working in his own line without added enthusiasm for his work, and without some increase in his ambition to be a worthy member of his guild. That stimulation of morale, so to speak, is, I believe, one of the most important results of attending meetings. Along with that, a more important gain is the addition to one's knowledge which comes from these conferences with men working in the same field. The reading of papers has never seemed to me the most useful part of such meetings. The papers might perhaps be as well read in private. The discussions are stimulating and suggestive.

But the clinical meetings are the thing in meetings for dermatologists. Our spe-

cialty is unique in this respect: we can make ocular examinations of patients that usually are sufficient for diagnosis, and thus we can in our meetings see great numbers of cases to advantage. I am sure that no single factor in my experience as a dermatologist has been more useful than the knowledge which I have gained from the demonstration of cases at clinical meetings. The value of such meetings is shown by the way in which local dermatological societies are developing. When I began the practice of dermatology, the clinical opportunities of this sort were confined to an occasional congress, or an occasional clinical meeting of a national organization. There was at my beginning a local clinical dermatological society in New York, but I believe no other one in continuous existence elsewhere in the country.

In February, 1901, after several years of effort, we succeeded in starting such a clinical society in Chicago. Now there must be more than a score of clinical dermatological societies in the country. To me there is no question of their very great value in the education of the men who go to them and in the uplifting of dermatology in their localities. My twenty years in the Chicago Dermatological Society has been one of my most valuable experiences. It is unpleasant to think how much more deficient I would have been in dermatology had that society not come into existence.

It is for reasons like these that I heartily encourage the development of a dermatological society in the South. The development of dermatology in the South has been difficult. A dermatologist must have for his support a large contributory population. We cannot, like some of our special colleagues, live upon a population of a few thousand people. The result has been that the number of dermatologists in the South has been few. Now I am delighted to see that many Southern physicians are devoting their time to dermatology and that they are going to get together.

The South is of necessity a section in itself. It is most closely in conection with the upper Mississippi Valley, and, speaking for that section, I can say that we are delighted and complimented when you come to join us in our meetings. But for vigorous development of the specialty in your midst the men in the South should not have to depend for their dermatological associations upon other parts of the country. You should have your own organizations nearer at home, so that more of you can get together in your annual meetings, and so that more frequent small meetings can be held. I believe it is evidence of a very wholesome spirit that the Texas dermatologists have organized a local society which meets frequently, chiefly to see cases. I should be glad to see other similar local societies develop, and have frequent meetings. Above these local organizations I believe it will be a good influence for Southern dermatology to have its own society which can meet once a year for the reading and discussing of papers, for the study of cases, and for the interchange of views informally among its members. I would put as the most valuable functions of this society the informal interchange of views among its members and clinical demonstrations. If this society is to be of the greatest use, provision should be made for at least one clinical session at every annual meeting.

The development of this Southern society, I take it, will be regarded by no one as a substitute for the national organizations. It should supplement them. This country is so big that the yearly meetings of the Section on Skin Diseases of the American Medical Association and of the American Dermatological Association spread out too thin to meet the needs of the dermatologists of the entire country. The American Dermatological Association has, of necessity, been largely an organization of the Northeast. You men of the South are entitled to your own organization, whose meetings you can reach with less inconvenience. As a past executive officer of both of the general organizations I am sure that I can speak for them in saying that this society will be heartily welcomed by them, and will have their encouragement; that if there shall be any rivalry between us, it will be the sort of friendly rivalry which exists between brothers each of whom is as proud of the other's achievements as of his own.

SOME OBSERVATIONS ON CARBOHYDRATE METABOLISM*

By Marvin Smith, M.D.,
Jacksonville, Fla.

For more than fifty years the evil effects of faulty carbohydrate metabolism have menaced the onward march of man's civilization. I therefore feel that it is not out of order to preface my remarks with the statement of two or three questions pertinent at this time.

Why do the sugars and starches cause more gastrointestinal disorders among children than any other food element? And why is it that diabetes mellitus and Bright's disease have increased enormously within the last thirty years?

What is the reason that William Osler said that 85 per cent of all the ailments of the human family have their origin in the gastrointestinal tract?

What is the reasonable etiology of pellagra?

What is the normal mouth reaction and what is its relation to carbohydrate metabolism?

Where is the explanation for pyorrhea, gastritis and colitis?

Where is the beginning and where is the end of carbohydrate metabolism?

I invite you to ask yourselves these questions. After you have done so, let us approach together the huge subject of carbohydrate metabolism with unbiased minds.

It is with a vivid consciousness of my own shortcomings, both inherent and environmental, that I have undertaken to interest you in this important subject. I propose in this discussion to propound the thesis that much of the suffering of the human family is due not so much to an imbalance between carbohydrates and proteins where proteins are deficient, but to an imbalance in diet where there is an excess of carbohydrates, beyond the point of utilization.

I shall make reference to the relation of perfect balance between proteins and carbohydrates in accomplishing functional perfection of the gastrointestinal tract. I shall advance presumptive evidence of the effects of imbalance between proteins and carbohydrates. I shall report experimental proof of the effects of this carbohydrate excess and show how it affects certain glandular secretions.

I shall finally argue that excess of this food element intoxicates the entire blood stream and exhibits itself as a systemic poison and thereby becomes a direct cause of pathology. I shall then leave you to decide for yourselves the meaning of my experiments and observations and the correctness of my interpretations.

In considering any phase of carbohydrate metabolism, the question of tolerance at once presents itself to us for understanding. It is the amount of carbohydrate food that any individual of given body weight is able to assimilate without clogging the system with unnecessary glycogen and without forming an unusual amount of toxic acid by-products. It is the rate at which the tissues are able to abstract glucose from the blood stream and to polymerize it into glycogen.

I wish at this point to refresh your memory with the statement that in health we now believe that the normal individual consumes carbohydrates and proteins in the ratio of 3 to 1 (not "16 to 1") and that functional perfection of the gastrointestinal tract is usually maintained only when this proportion is used.

Most of my observations relate particularly to the carbohydrate tolerance of the human body and to the suspected evils that we may suffer from intolerance. It can be seen very readily that this is subject to great variation, and it is this wide difference in individuals that makes consideration of the sugar and starch question a gigantic one. No two possess the same tolerance.

"The mechanism by which the body ordinarily disposes of excessive amounts of glucose absorbed into the portal blood is not adjusted to operate when the systemic blood is suddenly overcharged with this substance. In the one case the glucose is a foodstuff; and in the other because of its excessive concentration in the blood, it is more or less of a poison."

Such results, in other words, merely show us how much glucose can be added at a time without any overflow into the urine,

*President's Address, Southern Gastro-Enterological Association, meeting conjointly with the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

but furnish us no information as to the power of an individual to utilize a constant though moderate excess of this substance, and it is at this place that I hope to establish a line of cleavage and show that between the point of utilization where all assimilated glucose is put to use, and only normal by-products are left in the system, and the point of saturation where glucose lops over and is found in the urine, that there are between these two limits multitudes of individuals who are suffering and many who are dying with recognizable pathology. In fact, my contention is that between these two limits there is more disease and more suffering than can be found in all the other phases of faulty metabolism of this element. The early symptoms are often obscure and the appearance of disease most insidious.

The by-products of carbohydrate metabolism are acids, and when the saturation limit is reached, diabetes mellitus appears and the excess of abnormal acid by-products in the blood stream is a condition known as ketosis in contradistinction to acidosis which results from an accumulation of the acids of a normal metabolism from a faulty excretion by the kidneys.

I would not have you confuse in your minds the pathological picture of acidosis or ketosis with the observations I am attempting to present to you. You are all familiar with the dyspnea, the vomiting, the nervous manifestations, the cold extremities and the anxious expression which characterize this acute state; but my observations cover, if you please, a group of pre-acidotic symptoms which is not necessarily accompanied by diabetes mellitus or Bright's disease.

I take occasion to emphasize the thought here that when any individual exceeds the utilization point of carbohydrate intake, he is piling up in his system toxic acids in a blood stream which should be alkaline, and at every heart beat the tiniest capillaries strut with intoxicating fluid.

Exhaustive experiments and studies have been done on "the saturation limits" by Hamman, Hirshman, Benedict, Allen and Joslin, while the "utilization limit" has been thoroughly worked over by Woodyatt, Sansum and Wilder. McCarrison has shown experimentally that certain foods produce definite disease. Yarbrough has described a condition which he calls acidemia and claims that it is the cause of many metabolic diseases. The medical profession therefore possesses a working knowledge of carbohydrates as regards the saturation and utilization limits.

When any individual exceeds his tolerance to carbohydrates, a large group of symptoms may develop, but up to the present time I have not been able to find any systematic classification of these symptoms, nor have I seen any authentic statement of the definite pathology which they indicate.

In May of this year a dentist referred a patient to me whose mouth was so strongly acid that she was unable to get any relief with even extraordinary measures. Her gastric analysis showed complete absence of free HCl and total acidity. In the Dyrenforth Laboratory in Jacksonville I had the saliva analyzed and it was found to contain 0.1 per cent of hydrochloric acid and also diacetic acid.

Since seeing this case I have tested the saliva of 200 patients for reaction, and 196 gave decided acidity and only 4 showed alkalinity. A study of the daily menu of these 200 patients revealed the fact that for variable lengths of time 196 had used carbohydrates and proteins in a ratio of 4 to 1 or 6 to 1 or in some cases 7 to 1, while the four showing a decided alkaline reaction had been on a milk diet or a very low carbohydrate menu for weeks. No blood chemistry was done on this series. I might add that they represented almost every phase of gastrointestinal ailment.

Among the above number was a seaman who, while at sea under the influence of Bahama Island rum, got into a brawl with a fellow sailor and received a deep knife wound which extended across the left Stenson's duct, severing it completely. In ten days the wound had entirely healed except at the lower end, where the secretion from the parotid gland poured out constantly. From this discharging sinus I collected 10 c. c. of secretion and also 10 c. c. from the mouth and, after filtering, I placed in the two specimens 20 grains of plain white bread and it was noticeable that the secretion from the severed duct was more acid than that from the mouth and that the

former had a more active liquifying effect upon the bread than the latter.

I next subjected the patient to excessive carbohydrate feeding, giving him 2000 calories per day; and in seventy-two hours the reaction of the parotid gland secretion and also of the mouth had become very strongly acid. Indeed, so noticeable was the change that the patient complained of sourness of the mouth and soreness of the throat, whereupon the carbohydrates were reduced to 300 calories per day and by the standard litmus test the degree of acidity of the mouth and the parotid gland was promptly reduced to a faint trace. I wish here to call special attention to the fact that this patient received a normal amount of proteins during this period of testing and likewise a wholesome quantity of green vegetables and fresh fruits.

Deductions.—The dental case showed an unusual acidity of the mouth which I believe was the direct result of carbohydrate poisoning.

There is only one place in the digestive tract where the reaction should be acid and that, of course, is the stomach, and when the mouth is acid it is pathological and when the gullet is acid it is pathological. I contend that the urinary bladder is the only viscus in the body that is capable of exposure to either acids or alkalines continuously for any length of time without being damaged. I am not so sure that an alkaline urine would not in time establish disease in a bladder wall. It is only reasonable to suppose that if the saliva can become so strongly acid that it contracts and burns the mucous membrane, we might expect intractable mouth ulcers, diseased gums, fissured tongues and other signs of disease.

From the testing on the seaman we can certainly presume that the acidity of the mouth is due to, or closely allied with, the metabolism of carbohydrates. We may further presume that the reaction of the parotid gland secretion may be regulated and controlled by raising or lowering the carbohydrate intake.

From the 200 cases that were tested for mouth reaction we deduce the belief that the majority of people will show an acid mouth and that where an abundance of carbohydrates is taken as a food, this reaction is the rule. Furthermore, it would seem that a very large majority of the populace are eating excessively of this food element.

I am convinced that in this series the utilization limit has been exceeded, but in none was the saturation limit reached.

The individual whose dietary is overloaded with sugars and starches not only accumulates in his blood stream and tissues a quantity of acid by-products, but he invariably eats more of this food constituent than can be taken up during its hasty journey through the digestive tract. By the time it reaches the cecum much fermentation has taken place and a strong acid mixture lies in that portion of the enteron and as there is nothing to prevent absorption from going on extensively, this again further contaminates the blood stream and raises its degree of acidity. If the acid concentration of the blood stream is increased, the liver cannot perform its proper function and it is also reasonable to argue that the kidneys, spleen, pancreas and other organs alike suffer on this account and become the seat of pathology.

During the past summer I have conducted various experiments upon many domestic animals, feeding them upon different kinds and quantities of carbohydrates. Practically all of them sickened and died in four to ten weeks, showing principally gastrointestinal symptoms. The length of this discussion prevents my going into detail with these experiments, but I may state that ample vitamins and proteins were given.

After doing post mortem study on one of the guinea pigs and rabbits that had thus died, I submitted the viscera of the two animals to the Bunce and Landham Pathological Laboratory, in Atlanta, for careful study and they reported as follows:

"GUINEA PIG

"Kidney showed acute interstitial nephritis.

"Liver showed acute diffuse hepatitis with focal necrosis.

"Spleen showed acute diffuse splenitis with focal necrosis.

"Pancreas showed diffuse pancreatitis with destruction of the islands of Langerhans.

"Stomach showed ulcerative gastritis.

"Heart showed diffuse myocarditis.

"RABBIT

"Kidney showed acute diffuse nephritis.

"Liver showed areas of necrosis.

"Stomach showed acute diffuse gastritis.

"Lung showed bronchopneumonia.

"Heart showed acute endocarditis and myocarditis."

I believe that you will share with me the opinion that if excessive carbohydrate feeding will produce such pathology as that mentioned in the cases of domestic animals just cited, the same can be done and is being done in the human body all around us in countless individuals. We may safely assume from this that faulty carbohydrate metabolism puts in its most deadly work before the saturation limit is reached and that this is a stage of genuine poisoning. May we not from this draw a fair conclusion that hepatitis of the human liver, nephritis of the human kidney, and ulcerative and mucous conditions of the entire digestive tract of man may find in this a reasonable explanation? I believe that we can.

I hope not to become over enthusiastic or to make any dogmatic statements, but I must acknowledge that one year's intensive laboratory study on the carbohydrates has greatly stimulated my interest and that my eyes are beginning to open and that I can endorse the quotation:

"Let not him who seeketh, cease from seeking until he hath found; and when he hath found, he shall wonder."

A FEW POINTS IN RADIO-THERAPEUTIC TECHNIC OF THE FACE AND MOUTH*

By Walter A. Weed, M.D.,
Birmingham, Ala.

The technic of the mechanical application of radium and the x-ray is necessarily the predominant factor in success after the question of diagnosis, indication and dosage have been established. The variations in results obtained by different workers are in direct proportion to the precision and thoroughness of treatment. I have observed many unnecessary failures by men of unquestioned ability due either to a disregard of the importance of this factor, or to inability to execute the mechanical application of treatment. Within the past few weeks I have observed at different clinics two or three rather severe radium burns about the face due to failure to retain the radium in position during treatment.

There was no reason for this, and the effects from such maltreatment are more far-reaching than we might at first suppose. Until we radiologists attempt to work with the same precision and care as the most exacting surgeon does in the mechanics of surgery, our results will necessarily vary a great deal, and our specialty will necessarily get a great many just and warranted criticisms.

The question of dosage I shall not attempt to discuss here.

Often the treatment of lesions about the face and mouth by radio-therapeutic measures presents no special difficulties. However, quite a large number of these cases are extremely difficult to treat because of their inaccessibility and the mobility of the parts, for instance, epitheliomata involving the margin and mucous membrane of the eyelid. These cases can practically all be treated satisfactorily. There are no hard and fast rules, but each case is an individual mechanical problem. My plan is to cocainize the eye, cover the eyeball with a suitably designed piece of lead covered with rubber, evert the eyelid if necessary by means of adhesive plaster, a stitch, or a pair of chalazion forceps, and treat intensively. Likewise, lesions of the inner canthus may be given as intensive treatment as desired without danger to the eye itself or to the surrounding tissues. Lesions in this location are nearly always of the basal cell type, and in most instances are amenable to radio-therapy. It is pre-eminently the method of choice because of its efficacy, and the unapproachable cosmetic results. The choice between x-ray and radium is largely one of convenience. Everything else being about equal, I usually employ the x-ray because of the time-saving factor.

Another class of lesions that is often maltreated or under-treated is malignancies of the lip, especially of the inside of the mouth.

A case came under my observation about five months ago of a lady of advanced years. She had the most extensive case of leucoplakia that I have ever seen, covering practically all of the entire

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upper surface of the tongue, the buccal mucosa, the gums, and lower lip, with multiple epitheliomatous patches. She had been treated by a well known man in a distant city with practically no change of the condition. From her description, upon inquiry as to previous treatment, the deductions drawn were that she had been treated with a radium plaque, the radium content being, of course, unknown, for a period of thirty minutes to one hour every two weeks. It is obvious, of course, that no definite benefit could be expected from such treatment.

Probably my predecessor felt that it was hopeless, just as I did, and used his ammunition where he thought the chances gave more promise. Be that as it may, I gave her a total of 800 milligram hours (with a suitably designed applicator which I shall show you) within a period of three days, using from fifty to one hundred milligrams in twenty-five milligram tubes in close proximity to the parts, and unscreened other than the silver containers. In addition, I gave her an erythema dose of x-ray to either side of the cheek and under the chin, screened with three millimeters of aluminum.

In the treatment of lesions of the inside of the cheek especially, I think that the supplementary treatment by means of the x-ray from the outside is of considerable importance. Doubtless, all of you have observed the definite reaction of the mucous membrane of the cheek or nose one often gets when treating external surface lesions opposite these points. This patient had an extremely sore mouth following the treatment, but the point is this: she is apparently well following one series of intensive treatments made possible by simple mechanical devices for the purpose of holding the radium in position at desired points.

In epitheliomata about the face when there is considerable tumor formation, and in large moles, warts, etc., thermo-coagulation has been the most satisfactory method of destroying considerable tissue preliminary to the use of x-ray or radium. Thermo-coagulation as it is usually done is very painful, and has no great tendency to add to one's professional popularity. However, it can be done painlessly in most instances. Novocain is first used well around and beneath the tumor, after which is inserted two sets of multiple needles well beyond the margin of the tumor if it is malignant, and as deeply as desired. Each set of needles is connected together by a wire or small metallic chain. The two poles of the high-frequency machine are brought in contact with the two sets of needles. Thus the entire mass between the needles is thoroughly coagulated. If desired, the coagulated mass may be curetted away without pain while the anesthesia still lasts and the base of the tumor treated subsequently with x-ray or radium. Fulguration and thermo-coagulation have a tendency toward the formation of scar tissue. Therefore, it is important to follow their use immediately with x-ray or radium to obviate this tendency, even when treating benign lesions. The advantages of thermo-coagulation when done by this method are that it is both painless and bloodless, is relatively easily and quickly done, is without danger of dissemination, and there is a minimum risk of infection.

There are many factors to be considered in the treatment of lesions about the face and mouth, each case presenting its own peculiar physical characteristics and demanding its own method of handling. It has often occurred to me that not infrequently we neglect the importance of the practical application of treatment in our absorbed interest in the more theoretical and abstruse side of the question. Not only is there needed a knowledge of the histo-pathology, the differential diagnosis, and dosage necessary, as well as a delicate perception as to which particular method or combination of measures will be most efficacious, but, in our particular specialty one should possess a certain amount of initiative in devising satisfactory methods of application, and, furthermore, consummate concentration and an abundance of energy together with the courage of one's convictions.

425-429 Woodward Bldg.

DISCUSSION

Dr. W. P. Whittington, Asheville, N. C.—I have had quite a little experience in the desiccation and coagulation method described by Dr. W. M. Clark, who has had more experience than any man in the United States in the coagulation method.

I believe the essayist referred to the needle points being used by the direct current method. My method has been to use the single pole with a needle of any size and to inject 2 per cent novocain around the tumor. We can remove a tumor very quickly and painlessly with the Oudin current or the Tesla coil, which destroys it and does away with the necessity of using x-ray or radium afterward. I believe the Tesla current is better for secondary conditions because the heat radiating around will destroy those conditions in the surrounding tissues more effectually than the Oudin current.

A Member.—I have found in face lesions a convenient and accurate way of applying the radium so that you will not get secondary radiation and when you are through you will not find that you have treated one-half the

lesion and one-half the skin. My plan is to take a layer of protective, make a hole in it the size of the lesion, strap it to the face with adhesive plaster, and then put the radium over it. In that way I do not fail to cover the lesion.

Dr. Weed (*closing*).—The uni-polar method in small tumors, warts, etc., is very easily used, but if we are going to attempt to remove considerable tissue it is a very difficult method.

On a flat surface like the cheek or the back of the hand there is no difficulty about making the proper protection, but it has been extremely difficult to treat lesions of the tongue, mouth, inside of the cheek and lesions of the inner canthus.

The treatment of these conditions is not entirely a question of a man's knowledge, but of his energy and interest in his work.

NEEDS OF NEUROPSYCHIATRIC RESEARCH*

By George F. Roeling, M.D.,
New Orleans, La.

In presenting this paper for your consideration, I first apologize for deviating from a strictly scientific subject to this broad one, with time so limited.

Research in medicine is making some progress in all branches, especially along the lines of nervous and mental diseases and particularly so since our recent war experiences, and is holding out a very promising future, yet we individually and collectively as a body are lending very limited help.

This being, as it were, in the nature of a national organization, is the reason for my presenting this paper, calling attention to some of the needed requirements to meet with the strides of present research and the hopes of obtaining some discussion that would possibly lead to the bringing about of better results in so far as the elevation of the standard of this Section and an approach to greater efficiency are concerned. If we expect at all to reach attainment we must not only talk, but we must also show some form of concrete action in order to obtain the desired results.

As we all know, the aim of medical research is that of vanquishing and abolishing diseases. This can only be done by knowing the true etiology and then the proper scientific application of the remedial measures. It occurs to me just how little we do know at present of the causes of nervous and mental diseases and how little comparatively we have done as individuals and as a Section to prevent the increasing occurrences of these maladies.

As we are all aware of the increase in nervous and mental diseases throughout this country, especially since the recent war, it seems strange that so many individuals are unable to react and to adapt themselves to the sudden and rapid changes and demands of the present time.

We do know that inheritance plays a great part in the production of these diseases, as pointed out to us by Mandalin, which unfortunately is not based upon scientific principles but solely upon statistics which show some connection between cases. Many believe that inheritance of mental and nervous diseases are not due to direct defect of the germ plasm, but can be looked upon in the same way as the heredity of tuberculosis, namely, the inheritance of weak nervous and mental state which will not stand the strain of adult life. As we all know that at the time of puberty the human system is taken up with excessive physical and mental stress, new interest appears, sex interest, new traits develop, and sentiments revolutionize themselves. At this period circulation and metabolism of the brain are more active. These changes of circulation and metabolism have their influence upon the ductless glands and vegetative nervous system—all of these changes having their effect upon the part played in the establishment of disposition, mood and conduct, etc., of the individuals. It is at such time that the mind must reach its new development or succumb. Failure of adjustment at this time gives rise to neurosis or psychosis. The question then arises what should we do to check the occurrence of these cases and to improve upon our present method of handling them.

The following points, to my judgment, are worthy of some consideration:

The establishment of a national neuropsychiatric research commission as is being done at present in Germany, to take under its observation all psychiatrical state hospitals for the pur-

*Read in Section on Neurology and Psychiatry, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

pose of studying the minute anatomical and physiological changes that take place in the neuro-mental syndromes and to make a more definite study of the transmission of these diseases along the lines of the so-called inheritance theory. The formation of laws and the creating of public educational bodies having for their object the elimination of these diseases, thus elevating the standard of requirements of our Section and increasing our efficiency to its maximum.

There should be established out-patient psychiatric clinics under state control for the purpose of instituting early treatment of neuro-mental cases before structural changes begin to take place in the organism, thus avoiding the possibility of later hospitalization. It should be the duty of this clinic to give full attention and follow up all cases through the period of puberty under the supervision of competent trained nurses and social service workers, taking care of their environment, proper mental hygiene, and general body upbuilding. This should include the observation of all children who are mentally backward at school, as well as the children who are known as social misfits on account of their inability to adapt themselves to the social requirements of the school room.

That all medical colleges should have free access to all state psychiatric hospitals, there should be some direct connection between the colleges and the various state hospitals. All undergraduates should be required to have certain periods of study at these various hospitals before graduation. Such provisions would stimulate better interest in the work along these lines and would give the profession as a whole better acquaintance with these diseases. There should be established a program of mental hygiene that should teach of the development and preservation of the powers of mind. It should be largely in the nature of education and should emanate from the national research congress. It should embody all the information obtained by the study and experience at these various state hospitals. Greater attention should also be given the prevention and proper treatment of all infectious and venereal diseases, drug and alcoholic addicts.

We should further endeavor to prevent the inheritance of mental and nervous diseases, which can best be done by the elevation of high social ideals and by impressing upon the public the necessity for a higher standardization of the human species. By the teaching of proper hygiene of the body and mind, segregation, sterilization of the mental defectives, thus checking the procreation of defective stock.

By endeavoring to obtain the exclusion of importation into this country of all mentally inferior subjects.

There should be established universal rigid laws covering the requirements for marriage that will lead to the better development of the human race.

By the influence of better germ plasm by giving early observation, care, study and treatment to the expectant mother along the lines that will lead to the betterment of her offspring, such as the elimination of infectious diseases, improvement of environment, correction of nutritional defects, giving proper attention to blood reaction and chemistry, also the pathology of the kidneys and urine, the avoidance of the ingestion of known poisonous materials having injurious effect upon the germ plasm.

The rigid enforcement of all statutory laws that are already intended to stamp out faulty and detrimental habits having a tendency to lead to nervous and mental diseases.

In conclusion, I may state that before the work of research can show any striking beneficial results or obtain any degree of efficiency in our branch, we must, as individuals and as a Section, endeavor to obtain better cooperation between all the branches of medicine and the enlightenment and education of the general public along these lines.

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TROPICAL DISEASES AND PUBLIC HEALTH

THE CLINICAL ASPECTS OF BOTULISM: SYMPTOMATOLOGY, PATHOLOGY AND RATIONAL TREATMENT*

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Until further experimental data are available, physicians should scrutinize the various botulism outbreaks for evidence that the spores of B. botulinus may germinate and produce their toxin in the body. However, careful examination of all available information indicates that a true botulism infection following the ingestion of toxin-free spores never occurs in the human being. The symptoms are due to preformed toxins in the food.

SYMPTOMATOLOGY AND COURSE

When discussing the time of onset of symptoms of botulinus intoxication in human beings it must be borne in mind that the victims of botulism fall into two main groups, viz., those in which there is initial acute gastrointestinal disturbance followed by the typical botulism symptoms, and those in which the typical botulism symptoms are the first to manifest themselves. Approximately one-third of the recorded cases in this country in which data are available have shown symptoms of an acute gastroenteritis type; nausea, vomiting and diarrhea, which usually come on early, last for from 12 to 36 hours and disappear with the onset of the typical symptoms of botulism. In the remaining two-thirds of the cases the evidences of nervous system involvement have been the first to appear. Acute gastroenteritis is apparently the result of local irritation by the spoiled food which is ingested, whereas it is now known that the typical botulism symptoms are the result of the action of the botulinus toxin upon certain portions of the peripheral nervous system.

The onset of symptoms in botulinus intoxication is usually from 18 to 36 hours after the ingestion of the poison, although they may appear very much earlier or may be considerably delayed. The earliest onset recorded in the American literature is 2 hours, and in our series, 4 hours after the consumption of the spoiled food. The most delayed onset in this series occurred on the eighth day. In 74 per cent of the cases the onset of symptoms occurred within 48 hours and in general it may be stated that when the symptoms occurred very early they were of the acute gastrointestinal type.

When gastrointestinal symptoms are present, the patient may complain of burning and distress in the region of the stomach or there may be nausea and vomiting, with or without diarrhea, which may persist for a few hours or for a day or two. The characteristic effect of botulism is, however, an early inhibition of the gastrointestinal movements which results in early and persistent constipation, and when initial diarrhea is lacking the constipation may be one of the first symptoms noted. Frequently there is distension of the intestines, but there is rarely any pain, tenderness or rigidity after the diarrhea has ceased. The earliest symptom in the majority of cases is a peculiar indefinite lassitude and fatigue, sometimes associated with dizziness or headache, which the patient often attributes to the accompanying constipation.

Disturbances of vision occur very early and are frequently the first indication of illness. There may be initial scintillations and dimness of vision due to early loss of ability to accommodate for near vision. There is early involvement of the third cranial nerve and the occurrence of blepharoptosis, mydriasis, loss of reflex to light stimulation, and diplopia is practically constant. Occasionally the pupils may be irregular in contour and unequal. Complete loss of accommodation soon follows. Impaired function of the external rectus

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muscle appears earlier and more frequently than of the superior oblique muscle. Nystagmus and vertigo are not uncommon and photophobia has been recorded in a few cases. Nystagmus may be seen on one side only.

The majority of authors agree that there is no disturbance of the retina. Apparently the dimness of vision is dependent upon loss of ability to accommodate, as usually the patient can distinctly see distant objects with either eye alone.

Coincidently with or closely following the onset of visual disturbances there is usually difficulty in swallowing and talking, and frequently the patients complain of a sensation of constriction of the throat. The tongue appears to be larger than usual, is sluggish in its movements and heavily coated on the surface, although the edges may be clean. There may be complete paralysis of the pharyngeal muscles with loss of the pharyngeal reflex. The voice is low and without normal tone and eventually there is complete aphonia. Even in the milder cases the onset of early fatigue of these muscles is very evident, and after short attempts at conversation speech becomes noticeably slower and more difficult and the voice more husky.

The difficulty in swallowing is apparently largely due to impaired function of the pharyngeal muscles, as patients state that they have difficulty in forcing the food from the pharynx into the esophagus, but that if it is once started they can easily swallow. It is probable, however, that the dryness of the mouth and throat is a contributing factor, as in the milder cases of patients who are able to swallow solid food if they take a liquid also. Attempts to swallow frequently induce strangling spells which may be very severe, and may persist until the patient is exhausted. Regurgitation of fluids through the nose and insufflation into the trachea and bronchi frequently occur during the strangling spells.

General muscular weakness, especially weakness of the muscles of the neck, is most striking. In severe cases the patients lie with the muscles completely relaxed and are unable to raise their arms or legs from the bed. Although such a condition closely simulates paralysis, it is seldom that true paralysis of the skeletal muscles is observed. There is often incoordination of the muscular movements of the arms and legs, and the patients may have difficulty in picking up small objects and may walk with an ataxic gait, but the reflexes of the skeletal muscles are practically always intact.

A very striking characteristic of botulinus intoxication is the almost complete absence of sensory disturbances. There may be initial headache and gastric distress, but usually the patient does not suffer any pain. Occasionally there is tinnitus and partial deafness and a few cases have been reported in which there was numbness and tingling of the extremities, but in by far the greater number of reported cases it was noted that there was no disturbance of sensation.

Mentality usually remains clear until a very short time before death. Restlessness, insomnia and occasionally hysterical attacks are noted, particularly at the onset, but the patient often becomes apathetic or even somnolent as the intoxication increases. There may be spells of irritability when he is aroused, apparently induced by his inability to make himself understood, or to swallow, and often there is great apprehension of approaching death. Occasionally there may be coma for a short time before death, and a few cases are recorded in which there were convulsions, but a most striking feature of the intoxication is that mentality is usually unimpaired throughout the illness.

Inhibition of many of the secretions is also characteristic and the patients complain bitterly of dryness of mouth, pharynx and nasal passages. A few cases have been reported in which the salivary flow was increased, and it is said that this is usually true in forage poisoning in horses. But in the cases examined during this investigation the serous portion of the saliva has always been inhibited and there has always been a thick tenacious mucus in the pharynx which is removed with the greatest difficulty.

According to the literature there is usually inhibition of sweat secretion, but it is not uncommon to find the patient bathed in a profuse sweat which has an offensive

odor. When sweating is inhibited the skin becomes hard and dry.

There is considerable variation in the reports concerning the secretion of urine, but apparently in the majority of cases the amount of urine secreted depends directly upon the amount of fluid which the patient has received. Oliguria and anuria have been described, but that is not surprising when one considers the difficulty or impossibility of swallowing liquids. There has been no characteristic change in the urinary constituents or sediment in the cases of this series.

The temperature is usually subnormal. In the majority of cases it ranges between 96 and 98.6° F., and in uncomplicated cases remains low during the whole illness. Not infrequently there may be fever during the last days of the intoxication, but this is usually a sign of the development of bronchopneumonia.

The pulse rate may be low in the early stages of the intoxication, but later in the course of the illness it becomes rapid. It is not uncommon to observe a rate of 100 to 120 per minute and in some cases of as much as 150 or 160 per minute. The action of the heart muscle is impaired. There may be no visible cardiac impulse and the heart sounds are feeble and distant. The combination of subnormal temperature and rapid pulse is most striking.

There is often no disturbance of respiration in the early stages of the intoxication, but toward the end breathing becomes difficult and labored, and there may be extreme dyspnea and irregular breathing, sometimes of the Cheyne-Stokes type, with all the accessory muscles brought into play. Later, as fatigue of the respiratory muscles develops, there may be partial or complete asphyxia and the most frequent immediate cause of death is respiratory failure.

There are very incomplete data concerning the results of the ordinary clinical laboratory tests in botulinus intoxication. As was stated above, examination of the urine shows no characteristic changes from the normal. Blood counts have been made in a few cases without revealing any typical blood picture, although the number of cases in which examination has been made is much too small to justify any definite conclusions.

In our series there are records of 8 cases where red blood counts were made, and in 7 of them the count was between 5,200,000 and 5,600,000 per c. c. In 15 cases leukocyte counts are recorded and the count varies from 7,000 to 20,400 with four below 10,000, 7 between 10,000 and 14,000, and four 16,000 or more. In all but two where differential count was recorded the polymorphonuclear neutrophiles were between 70 and 85 per cent. In at least one case where the leukocyte count was over 16,000 necropsy revealed the presence of bronchopneumonia.

Examination of the cerebrospinal fluid has been recorded in four cases. In one instance it was stated that there were 80 cells per c. c., but the type of cells was not specified. In the remainder the fluid was reported normal.

Blood pressure records in six cases showed systolic pressures between 120 and 140 mm. and diastolic pressure of from 80 to 90 mm. In another case it was recorded that the blood pressure was normal and in two that the systolic pressure was 120.

It has been suggested that intraperitoneal inoculations of white mice with the citrated blood of persons suffering from botulism might establish a differential diagnosis or the type of intoxication. European reports are available that in serum collected on the 4th, 6th, 9th, 16th and 25th days after the consumption of the poisonous food, injected into white mice, the presence of toxin was demonstrated. This clinical test was tried in our outbreaks at Pittsburgh, Pa., with negative results. In addition, there are in various outbreaks definite histories of people eating the poisonous food without any harmful results whatever. In such occurrences it is suggested that their blood sera should be tested for any possible circulating antitoxin to account for their seeming immunity. Of course, one is cautioned to remember that there may be a concentration of toxin in various parts of the suspected food, in which event it may have been consumed without harm.

The duration of illness in fatal cases varies greatly, although the majority of

victims die in from 3 to 6 days after ingesting the poisonous food. In a series of 173 fatal cases where data were available, 18 persons died within 48 hours after the food was eaten and 1 survived for 26 days, but 117 persons, or 67.6 per cent, died in from 3 to 6 days after ingesting the poison.

Death usually occurs from cardiac or respiratory failure. It has been frequently observed that the heart continued to beat for several hours after voluntary respiration had ceased, and cases are recorded when artificial respiration has maintained life for several hours after voluntary respiration had ceased. Usually there is terminal asphyxia with cyanosis, and occasionally the patient dies in a strangling spell. It is not uncommon that there may be apparent improvement in the general condition of the patient, but that death results from insufflation bronchopneumonia.

When recovery occurs, convalescence is extremely slow and tedious. The severity of the illness usually reaches its maximum within 10 days of the poisoning and improvement follows slowly.

The strangling and the difficulty in speaking and swallowing frequently improve first, but the muscular weakness and the disturbances of vision disappear more slowly. Many cases are recorded in which the patients were comparatively well within two or three months. The disturbances of vision in some cases are the last to clear up and may persist for months. There appears to be no permanent severe disability, although some patients complain of constipation after recovery has taken place.

MORTALITY

The recorded mortality of botulism in the United States is very high, 61.7 per cent, and is surprisingly uniform in the various areas included, viz.: California, 61.3 per cent; Washington, 69.1 per cent; and other portions of the United States and Canada, 60.9 per cent. There is very great variation in the mortality of different group outbreaks, however, ranging from zero, 10.3 and 12.5 per cent, respectively, to 100 per cent in reports.

In a series of 246 cases where data were available and of which 173 resulted fatally, it was found that 147, or 85 per cent, of the fatal cases were persons in whom the onset of symptoms occurred within 48 hours after ingestion of the poison. In many outbreaks there is indication that the time of onset of symptoms is directly dependent upon the amount of poison ingested, and this observation shows that the severity of the illness and the mortality rate is also directly dependent upon the same factor.

A comparison of the mortality among patients who have an initial acute gastrointestinal disturbance before the onset of the typical botulism symptoms with those in whom the botulism symptoms are the first to be manifested indicates that, contrary to expectations, the initial vomiting and purging does not materially affect the outcome of the intoxication. All the records of cases in this country do not contain the necessary data, but in 180 cases where data were available it was found that 71.8 per cent of those who suffered acute gastrointestinal disturbances and 73.2 per cent of those in whom there was no initial nausea or vomiting resulted fatally.

PATHOLOGY

There is no characteristic gross lesion by which botulism can be recognized at necropsy. The only constant finding is the marked congestion of the central nervous system and of the abdominal and thoracic viscera. There may be multiple hemorrhages around the base of the brain and upper part of the cord, and the brain tissues may be edematous and show scattered hemorrhages. The lungs are congested and often show areas of bronchopneumonia. The heart muscle is soft and flabby, the liver, kidney and spleen are hyperemic and all the parenchymatous organs are opaque and cloudy on section. There may be ecchymoses and hemorrhages on the serous surfaces and in the lungs.

On microscopic examination, all the tissues show marked congestion, and often the arteries, veins and capillaries are all engorged with blood. In the brain and meninges there are numerous larger or smaller perivascular hemorrhages around the distended vessels, and in the brain and other organs, especially in the lungs, there may be large hemorrhages which extend

beyond the immediate vicinity of the vessels.

The occurrence of cellular thrombi of the type first described by Ophuls are very often found in the tissues of patients in whom the progress of the intoxication has not been too rapid, but they may not occur when the duration of the illness has been very short. When present, they are very suggestive that death has been caused by botulinus intoxication, but, as was recently pointed out by Dickson, they cannot be considered pathognomonic of botulism. In a series of 12 necropsies of human victims of botulism, the tissues of 9 contained the typical thrombi, and of a large series of experimental animals which survived longer than for 48 hours after the administration of toxin, the tissue of the great majority also contained the thrombi.

In none of this series of human victims of botulism, nor of animals in which the poisoning was experimentally produced, has there been any indication of destruction of the ganglion cells such as was first described by Marinesco. Neither has there been any indication of perivascular infiltration with lymphocytes such as is characteristic of epidemic encephalitis, save in one case which has been recorded by Geiger and in which a very few lymphocytes were seen in the areolar tissues around a few of the blood vessels in the brain. There should be no confusion in the microscopic diagnosis between botulism and epidemic encephalitis, since perivascular lymphocytic infiltration is not a characteristic lesion of the former.

Nothing definite can be said as to the value of antitoxin in the treatment of botulism, although thus far no satisfactory results have been obtained. It has been shown by experiment that animals can be fully protected if sufficient antitoxin is given simultaneously with or within a short time after the administration of the toxin, but that the proportion of the fatalities rapidly increases as the interval between the administration of toxin and antitoxin is increased. A few cases were noted where animals recovered although symptoms of poisoning had appeared before the administration of the antitoxin.

Complete data concerning the administration of botulinus antitoxin to human victims of botulism in the United States are not available, but there are at least eleven outbreaks in which it has been used. In two instances it is known that a type B antitoxin was used in what was later proved to be a type A intoxication, and in three others the details concerning the administration of the antitoxin have not been published. There are six outbreaks, however, in which homologous antitoxin was administered, and concerning which the details of its use are known, and these afford the only reliable data at hand upon which to base any conclusions as to its efficacy.

In these outbreaks 31 persons were ill and 23 died. Seventeen of the patients died before antitoxin was available, and 6 succumbed after receiving the injections. One person recovered without having been given antitoxin and 6 recovered after it had been administered.

The mortality in these outbreaks was 74.2 per cent.

In only three of the outbreaks did any of the victims recover after receiving the antitoxin, and analysis of these shows that in every instance the more severely poisoned persons had died before the antitoxin was administered, and that those who were the more seriously ill when they received the antitoxin succumbed in spite of its use. In no instance was antitoxin available until at least four days after the poisonous food had been eaten, and in one instance it was not administered until the ninth day.

The only conclusion that can be drawn from these observations is that botulinus antitoxin is of no value as a therapeutic agent when given late in the intoxication. There has been no record of its administration sufficiently early to enable any comparison with results which can be obtained at will under experimental conditions, and none to indicate that it would not prove efficacious if given early in the intoxication.

In all instances of botulinus intoxication, therefore, the antitoxin should be administered as soon as possible after the consumption of the poisonous food. Time may be gained by using polyvalent serum or a mixture of both types of serum until such time as the type of the toxin has been determined. It should be given intrave-

nously, after the patient has been tested for hypersensitiveness, and, if necessary, desensitized. Large doses, at least 20,000 units, should be given and since it seems probable that there is no continuous formation of toxin after the poisonous food has been ingested, a single administration of the whole amount of antitoxin is preferable to repeating small doses. In any event, caution is advised in the handling of patients. Immobilization and quiet is indicated by the best means available, which the symptoms and the condition of the patient may suggest. It is almost unnecessary to call attention to those familiar with the disease in animals to the often observed fact that the merest roughing of the animal hastens materially the outcome.

It can be readily seen from this discussion that the time of administration of antitoxin is the most important factor in the treatment of human cases of botulism. While it is almost equally important to have confirmation of the type of the toxin causing the symptoms, yet from our knowledge ascertained in the epidemiological investigations of 114 outbreaks in human beings, intoxications with type B are exceedingly rare. Particularly is this true of preserved foods processed west of the Rocky Mountains. The following facts are now well known, namely: that the distribution of the spores of B. botulinus is practically universal, that the soil of mountain ranges yields more positive results than those intensively cultivated, or subjected to pollution, that the distribution of types seems not to be limited to particular regions, and finally that both types may exist in the same soil or specimen, the toxin of one only being demonstrable by neutralization tests with suitable antitoxins.

Rabbits, mice and guinea pigs are equally susceptible to the toxin, but mice are preferable for typing, results being readily obtainable in a few hours. By this time the patient can be desensitized and treatment begun with specific antitoxin.

Just as the known cultural tests for the isolation of the paratyphoid-enteritidis group of organisms should always be used as a routine procedure with suspected foods and excreta, or both, in general food poisoning, there should be used the simple methods of typing of toxin in the food suspected of causing botulinus intoxications. With the antitoxin now available, usually 0.25 of a c. c. of the liquid portion of the suspected food or its emulsion, centrifugalized or not, plus A and B antitoxin sufficient to make 1 c. c. each, mixed directly in the syringe and injected intraperitoneally into mice has been found sufficient both in dosage and dilution to obtain results in the time given above.

Though intoxications in animals just as in man are due to preformed toxins in the food, feeding and inoculation experiments in guinea pigs with detoxified spores, even when such spores have received additional saturation with specific antitoxin and been incubated, have yielded some interesting data. This may be briefly summarized as follows:

(1) There is no doubt that there is considerable variation as to the susceptibility of guinea pigs to botulinus intoxication with spores.

(2) There is a considerable difference of results in animals inoculated subcutaneously and fed with spores.

(3) Unquestionably spores may remain latent in tissues of animals for many weeks without the animal's showing any indication of the disease.

(4) It is comparatively easy to isolate the spores of B. botulinus from practically every tissue of the body after feeding or subcutaneous inoculation of the spores.

(5) There may be a quantitative relationship both of the feeding and subcutaneous inoculation as to the number of spores.

Finally, it is desired to reiterate that epidemiological and experimental evidence seems conclusive that Type A is the predominant type in outbreaks among human beings in America, and that Type A is probably the more toxic.

SUMMARY OF DENGUE RESEARCH, OCTOBER TO NOVEMBER 13, 1922*

By W. L. Holt, M.D.,
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(*1*) *Mosquitoes.*—Twelve were collected in the elevator of the Cotton Belt Hospital at Texarkana, October 17. There were six cases of dengue there at the time. All 12 were identified by Mr. Komp, of the U.S.P.H.S., as Culex fatigans. No attempts were made to transmit infection by bites of mosquitoes.

(*2*) *Patients' Blood.*—Ordinary blood smears were negative in all cases except No. 12, which see later. (Dr. T. E. Sanders, of Hot Springs, found just one spirillum in one thick smear out of 13 cases so examined by him.) Leukocyte counts on the author's cases ran from 12,600 down to 3400. All had a leukopenia except one, No. 5.

(*3*) *Blood Cultures.*—These were made on all cases seen but one, making 11. Noguchi's yellow fever medium was used, consisting of 3 parts Ringer solution and 1 part sterile human serum with 0.3 per cent agar. About 2 c. c. of the patient's blood were taken aseptically from the arm vein, put at once in the culture tube, mixed, and about an inch layer of sterile paraffin oil added to exclude oxygen.

Cultures rarely showed any turbidity after a week. Four cultures, however, showed a few round, dark staining bodies, all similar in appearance (cultures 2a, 5, 6, 9), which were taken for some micro-organism. They varied in size from 1 to 5 microns, being usually about 4 or 5 microns. A subculture in lactose bile from pig No. 5 showed some of these bodies with two nuclei.

(*4*) *Animal Inoculations.*—(a) Guinea Pigs: Blood from three cases, 5, 6 and 11, was injected intraperitoneally into guinea pigs on the 2d, 3d and 8th days of illness, respectively. Unfortunately one pig, Case 6, died accidentally of chloroform 24 hours after injection, and the third pig could not be inoculated until the blood had stood overnight in citrate. A culture from the blood at autopsy of pig No. 6 did show a similar organism to those found in blood cultures of patients. The third pig, Case 11, remained negative, probably showing that the organism had died out in the patient by the 8th day, as the transmission experiments of Cleland and Bradley indicated it did by 130 hours, or 5½ days.

Pig No. 5, inoculated from Case 5 on the second day, was the basis of most of my animal work. He ran a normal temperature (99.1 to 100.5°) until the sixth day, when he had 102.8°, but this was probably due to an abscess at the site of inoculation. He did not seem ill, and fever was gone next day. Nine days after inoculation this pig showed in the fresh blood from the ear numerous peculiar motile organisms of different shapes, which were found later in the pig and the rabbit inoculated from him.

Culture 5p, made in Noguchi medium from serum aspirated from this pig's abscess, showed globular bodies similar to those in patients' cultures. A lactose bile subculture showed many of these globules about the size of a red cell. Some were certainly protozoa, as they showed a cell wall and two nuclei. A Giemsa stain showed a body with 5 red-staining nuclei and several curved, spindle-shaped organisms.

Pig No. 15 was inoculated on October 23 with this culture, 5p, intraperitoneally. He also kept well until he developed a sore on his back from a bite, which became infected. He ran a fever of 102.6° on the fourth day and fever on the fifth and sixth until it healed. His blood showed a much richer growth of the protozoon than pig 5. Many different forms were seen at different times in the fresh blood in a wet smear.

On October 25, 48 hours after inoculation, I saw in his wet blood a small very motile oval organism and a few larger oval bodies of about 4 to 5 microns with distinct moving flagella or cilia. They were denser than red cells, had sometimes many coarse granules or nuclei, and moved independently. (Similar organisms were seen later in rabbit and patient's blood.)

On October 26, Dr. Hoge took blood aseptically from this pig's heart and put it in 2 per cent sodium citrate. Most of this was promptly injected intraperitoneally into pig No. 15. A drop examined then at 4:45 p. m. showed very many actively motile, long, slender bodies, somewhat like trypanosomes, of varying shape and length. Some were 15 microns long, the longest. They moved slowly from place to place, but had a rapid wriggling motion.

The very same specimen of citrated blood, after standing one hour at room temperature, showed very few of these slender bodies, but a corresponding number of round or oval granular bodies. Evidently the slender bodies must have contracted to the round or oval form, perhaps due to the citrate.

The possibility of accidental infection of this pig from a trypanosome-infected rat was considered. Nearly all the other pigs in the animal room (six) were carefully examined and no organisms found in their blood. Also these trypanosome-like protozoa were not seen again in this pig's blood in spite of repeated trials.

On October 28 this pig's blood from the ear showed neither the long slender nor the round granular forms, but was full of very small granules, so small and active that it was impossible to determine their shape in wet mount.

(b) Rabbits: Rabbit No. 1, after the blood was found negative and temperature normal, was inoculated intravenously October 30 with heart's blood of pig No. 15. Like the pigs, the rabbit showed no symptoms, but five days later had the organism in his ear blood.

On November 4 his blood showed in wet mount all the various forms of the organism already seen

*Read in Section on Public Health, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

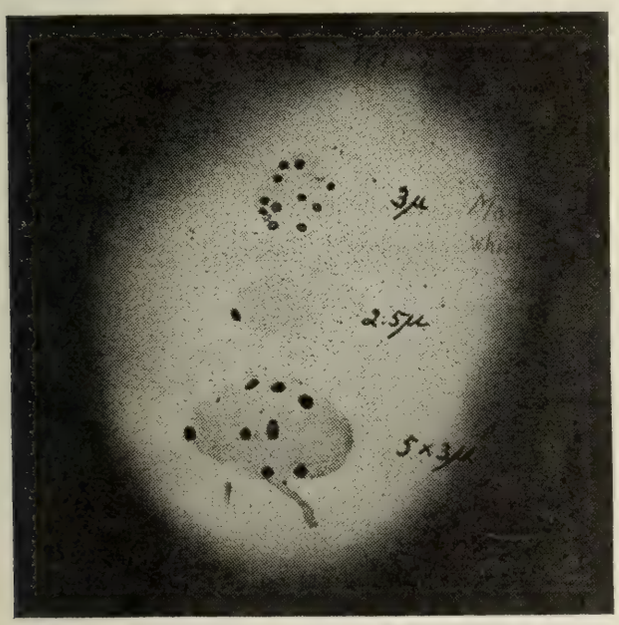
in pigs Nos. 5 and 15. Many of the parasites were flagellated, but none resembled trypanosomes.

Rabbit No. 2 was inoculated November 7 with 2 c. c. of ear's blood obtained nearly sterile from rabbit 1.

Rabbit No. 3 was inoculated intravenously with 1 c. c. of citrated blood 30 hours old, obtained by Dr. Beck, of Texarkana, November 11 from the arm vein of a very severe case of dengue at DeKalb on the tenth day of the disease. The man was at the time very ill. The rabbit was inoculated November 12. The citrated plasma of this case showed very many organisms at this time, alive and quite similar to those first seen in Case 12, mentioned below.

(5) *Organisms in Human Blood.*—I found distinct and certain organisms in human blood of cases of dengue for the first time at the Cotton Belt Hospital, Texarkana, November 10 and 11.

Case No. 12 was typical with a good rash, leukopenia of 3400, severe pains, nausea and no history of malaria. This patient was a nurse at the Hospital, where nearly all the employees had had dengue that fall. She became ill November



Dengue protozoa blood smear of Case 12. Wright stain. Drawn, colored and photographed by W. L. Holt, December 11. Black dots are red nuclei. Cytoplasm of upper and lower forms is greenish yellow; of center one, pink. Sizes marked in print.

8 at 4 a. m. with severe headache and general pains, but no chill. She had sore throat, no cough, marked rash on the neck when seen on the third day, which she said was over most of her body. Her temperature ran as follows: first day, 102.4°; second day, 102.6°; third day, 99.2°; and fourth day, 98.5°. Age 24; Miss L. S. Holland.

An ordinary blood smear was stained by Wright stain and carefully examined by me, by Dr. Hoge, Director of the Hygienic Laboratory at Little Rock, and by Miss Mildred Moss, an expert on diagnosis of blood for malaria. All agreed in finding no malarial parasites in this blood. Dr. Hoge saw a few inclusions in the red cells of various sizes from round bodies, about 1 micron in diameter, mostly with intensely red nucleus, up to a couple of large oblong bodies nearly filling the red cell. They did not show ring forms or brown pigment, and Dr. Hoge declared they certainly were not malarial organisms.

My chief find was made Saturday morning, November 11. In the citrated blood of this case, No. 12, which had stood overnight in the ice box, in the colorless cloudy plasma above the red cells I found in great abundance very similar protozoa to those seen in inoculated pigs and rabbits.

Most numerous were small ameboid forms, usually having one, sometimes two, long flagella. There were also a good many large round or oval bodies with twenty or more nuclei and distinct short cilia, and smaller round forms with one or two nuclei.

I make no claim that these polymorphous protozoa, which I have found in my inoculated animals and the blood of two patients, are the causal organism of dengue, but simply report my findings with the idea that they may be of some assistance to further research.

The facts that the inoculated animals were not injured by the organisms and that they seem quite too large to pass through a bacterial filter are very much against their being the true germ.

NOTE.—After making the above report I found by careful study of a stained smear of blood of Case 12 some very suggestive nucleated bodies rarely present, closely resembling the multinuclear protozoa seen in the citrated wet blood of the same case. Not being able to get a clear direct photograph of these bodies, I carefully drew and colored them, enlarged, and then made a photograph of the drawing, which is published herewith. These organisms looked quite different from platelets, staining differently; they had mostly greenish yellow cytoplasm and bright red, distinct nuclei.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

COLLOIDAL PREPARATIONS, ESPECIALLY COLLOIDAL SILVER CHLORID*

By Edgar G. Ballenger, M.D., F.A.C.S.,
Clinical Professor of Genito-Urinary Diseases, Emory University,
and
Omar F. Elder, M.D.,
Assistant Professor of Genito-Urinary Diseases, Emory University,
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If an ounce of silver nitrate is dissolved in a quart of aqueous solution of acacia and then slowly added to a quart of acacia water in which is dissolved three drachms of sodium chlorid, a milky white preparation is produced which is more potent as a germicide than pure carbolic acid, yet is non-irritating when applied to mucous membranes. Its toxic effect is so slight that spermatozoa can live and remain actively motile in it for 15 to 25 minutes. One cubic centimeter of it given intravenously to rabbits inoculated with Staphylococcus aureus sterilized the blood in 24 hours and cured the rabbits so treated. The controls died in from 48 to 72 hours with multiple abscesses of the heart, liver, kidneys, etc.

It is my purpose to discuss briefly the phenomena associated with substances in such a colloidal state as the silver chlorid and the processes whereby an active agent like nitrate of silver may be changed from an irritating solution to a non-irritating preparation, at the same time retaining an adequate amount of its germicidal activity.

A silver wire placed upon an agar plate planted with the Staphylococcus aureus prevents the organisms from growing immediately around the wire. Silver filings placed in a test tube containing water give off to the water a germicidal substance. The minute masses of silver chlorid, when in a colloidal state, give off a similar substance which probably accounts for its bactericidal activity. It is likely that the enormous increase in the surface provided by the minute subdivisions of the silver chlorid when in a colloidal state accounts for its relatively high germicidal coefficient.

There is a markedly selective bactericidal activity exhibited by this preparation of silver. Moulds and fungi will grow upon a solution stronger than carbolic acid, as regards the destruction of pathogenic organisms. To prevent this, we add about one or two drachms of carbolic acid to the gallon. In hot weather it also shows a tendency at times to ferment. It does not coagulate albumin and is not precipitated by chlorids.

COLLOIDS

The word colloid comes from the Greek word, kolla, which means glue. Colloids have certain definite characteristics which differentiate them from crystalloids, which we shall not discuss. We shall consider rather substances in a colloidal state, their preparation and preservation, especially silver chlorid.

Metallic, or insoluble substances, if minutely subdivided or precipitated in a solution which contains a colloid such as acacia, gelatin, etc., assume a peculiar form known as the colloidal state. The little masses tend to remain separate and are charged with either positive or negative electricity. They are constantly in motion and by bumping against each other remain uniformly distributed throughout the liquid in which they are suspended. They are easily visible through the dark field microscope. There is a tendency for them to coalesce and make bodies of large size which may finally become so heavy that they sink to the bottom and lose their motility. This occurs in from a few days to a few years, according to the content of the colloidal substance such as acacia or gelatin, which tends to keep them apart.

*Chairman's Address, Section on Urology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

It also depends upon the chemical character of the solution as to whether an active ingredient still remains chemically unsatisfied and whether the electrical balance between the bodies is about even.

PREPARATION

Without going into the subject deeply, we wish to give some of the practical points we have observed. Acacia has been found to be one of the best colloids; i. e., solutions containing it have a surface tension which is sufficiently great to hold these small masses apart for a longer time than do most of such glue-like substances.

The fineness of the bodies and their stability vary with the amount of the acacia in the solution, with the rapidity of agitation of the solutions when the preparations are made, with the concentration of the colloidal bodies and with the viscoscity of the solutions.

We are assuming that they are made by the precipitation method, for instance such as that of precipitating a solution of nitrate of silver with a solution of sodium chlorid. In each solution should be sufficient acacia to prevent the formation of large masses.

Invert sugar has been found to be of greater value in making the preparation thick, thus tending more to prevent these bodies from coalescing than ordinary sugar.

Professor Weems, Chemist at Emory University, also found that bile salts, the glycocholate and taurocholate of soda, are of great value and assist us in obtaining very fine colloidal bodies.

The type of the colloidal preparation to be made naturally varies with one's wishes. If it is intended for immediate use, the amount of stabilizing colloid and sugar or syrup need be small compared with the amount required if it is to be kept for a considerable period of time.

Generally speaking, we may bring any soluble substance into a colloidal state by precipitating it in a solution containing acacia. The colloidal bodies are smaller if both solutions contain stabilizing acacia, bile salts, etc.

If a very weak solution of nitrate of silver is precipitated with a solution of sodium chlorid without acacia, a milky white color is produced, and it remains in the colloidal state for a while. If stronger solutions are used without acacia, etc., a heavy flocculent precipitate forms and promptly settles to the bottom, leaving a clear solution above. It is to prevent this that the glue-like substances must be added to keep the bodies minute and thereby increase the surface of the insoluble substances which are held in the colloidal state.

As previously stated, from the surface of these minute, though visible masses, invisible ions are given off into the surrounding solution. These are definitely germicidal and relatively non-toxic and non-irritating even when applied to acutely inflamed membranes.

At first we were puzzled as to how apparently insoluble substances could exert a germicidal activity. That this is due to minute amounts coming away into solution we think is proved by the following tests: a silver wire was encased in a capillary glass tube and the tube was broken away from part of the silver wire. This was placed on an agar plate plated with staphylococci. The organisms grew close around the part covered with glass, but did not grow close to the exposed wire. This test, we think, disproved the statement we made in our preliminary report that these emanations penetrated thin glass. We are unable to explain the phenomena which caused our error unless a certain amount of the silver was fused at the ends of the capillary tubes in which we sealed the colloidal silver chlorid. They were immersed in fuming nitric acid to cleanse the surface and destroy the hay bacillus. They were washed in sterile distilled water and then planted on the agar plates.

If potassium iodid be used instead of sodium chlorid we obtain a light cream colored preparation which is silver iodid. It does not darken as does the chlorid when exposed to light, is more stable than the chlorid and less active as a germicide.

By precipitating an acacia solution of silver nitrate with salicylate of soda we obtain rod-shaped colloidal bodies. We have been unable to find previous reference to this fact in the literature upon colloidal preparations. The colloidal salicylate of silver is more difficult to prepare

than the chlorid or iodid, as the bodies are likely to be too large unless the proportions are exact. Here the value of bile salts is clearly demonstrated. If no bile salts are added, the rod-shaped bodies may be so large that they are inactive. If bile salts are added in small quanities, the bodies are smaller and actively motile; while if we add more bile salts, we may obtain a colloidal preparation with small round bodies which cannot be distinguished with the ultramicroscope from other substances in a colloidal state.

Benzoate of silver in a colloidal form is characterized by bodies which are quite large and look like cross sections of oranges. The addition of bile salts greatly reduces the size of the bodies.

If iodid of potash, sodium chlorid, salicylate of soda and benzoate of soda are all mixed in one solution with acacia and then precipitated with a silver nitrate solution, gradually added, we obtain the colloidal preparation of each of the substances formed in the order named. That is, all of the potassium iodid is taken up by the silver before any of the chlorid is combined with the silver, which in turn has a greater affinity for the silver than the salicylate and benzoate. As was previously stated, we believe the chlorid of silver is of more value as a germicide than the iodid, probably because it is an ill-balanced molecule and less stable. We have not tested the salicylate or benzoate sufficiently to express an opinion.

PRACTICAL APPLICATION

If finely sprayed into a room, colloidal silver chlorid may remain in the air for many hours as a fog. This, when inhaled, gives a peculiar metallic taste which may last for a considerable time, showing that a definite amount has entered the system by way of the lungs. This might be employed for the treatment of certain pulmonary conditions.

Tin foil may be used as an indicator to determine if there is any free silver nitrate in the solution after it has been prepared. If there is, the tin foil will immediately turn dark when wet with it.

All of the protein salts of silver, when observed with the ultramicroscope, show that the silver is in a colloidal state. This, perhaps, accounts for the fact that they all tend to be less effective when the solutions are stale.

What ultimately becomes of the ions which come away from the small masses of silver into solution we are unable to state. Probably they unite in some way with other bodies and thus increase their size.

The clinical results from colloidal silver chlorid in the treatment of urethritis are not strikingly better than the other remedies we are accustomed to use. In fact, many of our remedies are adequate from a germicidal standpoint. The relapsing cases and troublesome ones come from deep-seated foci not reached by the remedy no matter how potent.

We regret that the limited time makes it impossible to discuss intravenous injections of colloidal silver chlorid and other intravenous germicides.

There must always be a disadvantage in the use of colloidal preparations intravenously because they require substances like acacia, which is a vegetable protein, and every now and then gives a disagreeable serum reaction. For intravenous preparations, the minimum amount of acacia should be used and dextrose employed instead of invert sugar or syrup. Each solution is previously sterilized in an autoclave and after being prepared it should be filtered. The dose may vary from one to three cubic centimeters of a 1 per cent solution. If there is a leak around the vein, it causes a decided inflammation like that from arsphenamin.

Among the undetermined possibilities we might mention the fact that colloidal bodies may be taken up to come extent by the phagocytic lymphocytes, then carried to the inflamed parts, thus tending, perhaps, to concentrate the germicide at the point most needed. It has been observed at the Rockefeller Institute and elsewhere that endothelial cells in proliferating or chronically inflamed tissues are markedly phagocytic. This may further assist in concentrating the germicidal bodies where most needed.

GERMICIDAL CATGUT

We have been carrying on a few experiments with catgut, first soaking it in a silver nitrate solution, then when dried,

again soaking it in a sodium chlorid solution. By this means the silver chlorid is precipitated in the substance of the catgut so that subsequently the germicidal quality of the silver is available for a considerable period of time, as it is fixed in the catgut in an insoluble, though active form.

As you see from this report, there are many phases of this subject which have not been adequately investigated, and we hope others may interest themselves in this or related lines of work.

Some of these fanciful theories, of course, may prove of no value, but they give us something to think about and ideals to work for which ultimately may prove of value.

CORRECTION OF CLEFT PALATE*

By W. A. Bryan, M.D., F.A.C.S.,
Nashville, Tenn.

The age at which operative relief of cleft palate should be undertaken, if the surgeon may elect, depends upon the method employed by that surgeon. What is said in the following pages refers only to my own experience, and is intended to apply only to the operation or modifications employed in my work. It should be the privilege of any patient at any reasonable surgical age to obtain relief from this doubly hideous defect, just as in any other type of elective surgery. There is an age of choice beyond any question, and this age is, for closure of the hard and the soft palate, about twenty months, with the understanding that the harelip and the alveolar cleft shall have been repaired as soon as possible after birth, preferably at the age of two to four weeks. This is not intended to disparage those who have not been fortunate enough to obtain such relief early, for the advantages of repair are sufficient to justify correction of both palate and lip even to the age of middle life.

The reasons which justify the earlier operation on lip and alveolus and the later operation on the palate are of sufficient importance to warrant their enumeration:

A. (1) During the early weeks of life the bones of the face are preponderantly cartilaginous and may be sprung back into position by pressure. Later, when ossification is more advanced and the bones are less elastic, it often requires partial severance of the bone. This causes the bone to swing into position, as it were, on a hinge and tends to give a flatter front to the arch than when the os incisivum is forced into position.

(2) The disfigurement of these cases increases disproportionately as the child develops. If operation is done early this accession to the primary deformity is avoided.

(3) The nostrils mold more readily back into a normal shape, or more closely approximate the normal, in cases operated upon early.

(4) While a certain amount of disturbance may arise from eruption of the teeth in any of these complete cases, the interference with the operation is less if it is done early. It is not difficult to imagine that teeth erupting from a corrected arch, the relation of whose parts at least approximates normal, will have more natural direction, position and occlusion than teeth growing wild from an unclosed cleft which has no restraint on their growth and no function.

B. (1) The cleft palate, hard or soft, or both, should be corrected at the age of 18 to 20 months, not because it cannot be done later with greater mechanical success and less risk of failure, but because better function can be expected if the closure is done before the child begins to form word ideas inaccurately. Once these ideas have established themselves, although the child may have a body mechanism with which to form words accurately, he will do so only approximately well, and as soon as he forgets to watch every utterance he lapses back into the old style almost as surely as a washed sow returns to her wallowing. Yet I have operated upon one woman past forty who in a year's time gave no suspicion of the former defect in her speech.

(2) The tissues are so friable in the earlier months of life that it is very difficult to get union throughout, and besides the combined operation on lip and mouth would, in my judgment, prove to be too

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much surgery in an appreciable percentage of cases.

The most important cosmetic feature concerns the primary operation and specifically the reposition of the os incisivum to restore the alveolar arch. Too far forward this bone gives a prognathous effect, and too far backward it is worse still, giving a countenance bad enough in full face and hopelessly hideous in profile. Another feature of the replacement of the os incisivum in cases of bilateral cleft of the alveolus is that it must be fixed in such position that the teeth will grow in the right direction, neither pointing backward nor too much forward, otherwise occlusion with the lower incisors will not be possible and the appearance of the mouth not good. In practice this item is cared for by avoidance of too great downward and backward rotation of the os incisivum on its transverse axis, and by fixing the bone after reduction so that no further rotation will be possible.

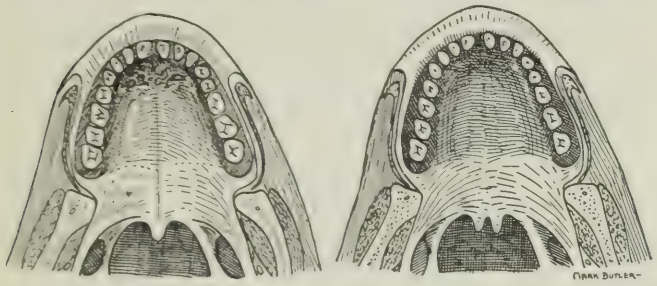

Fig. 1 Fig. 2

Fig. 1.—Outlines of hard and soft palate.
Fig. 2.—Bifid uvula.

Fig. 3 Fig. 4

Fig. 3.—Cleft involving part of soft palate.
Fig. 4.—Cleft of whole soft palate.

Fig. 5 Fig. 6

Fig. 5.—Cleft of soft and part of hard palate.
Fig. 6.—Cleft of entire palate.

At the second operation, whatever the age of the patient, there are certain conditions which must be complied with if even moderately uniform success is to be had.

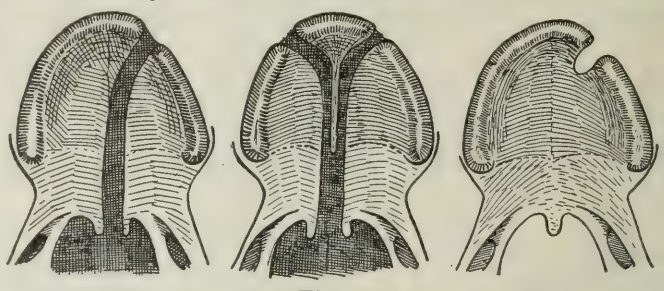

Fig. 7 Fig. 8 Fig. 9

Fig. 7.—Complete unilateral cleft palate.
Fig. 8.—Complete bilateral cleft palate.
Fig. 9.—Alveolar cleft.

These conditions are not special for cleft palate work. They apply very largely in general surgery and particularly in plastic surgery. The ease with which they are overlooked, the difficulty with which they are applied with judgment, are two causes of failure to get union in these cases.

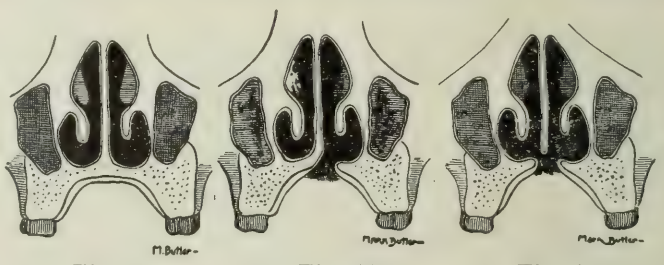

Fig. 10. Fig. 11 Fig. 12

Fig. 10.—Transverse section of hard palate.
Fig. 11.—Transverse section of unilateral cleft.
Fig. 12.—Transverse section of bilateral cleft.

(1) It is necessary to have the edges raw throughout on both sides of the cleft so that only raw tissues will be in contact after suturing. This sounds very simple, but I am convinced that failure to do it is a more common cause of non-union than we have heretofore believed. In cutting the mucous membrane away at the juncture of hard and soft palate it is a very

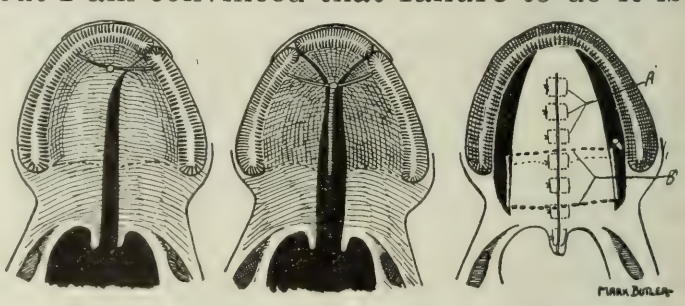

Fig. 13 Fig. 14 Fig. 15

Fig. 13.—Result of first operation on cleft. Unilateral type.
Fig. 14.—Result of first operation on cleft. Bilateral type.
Fig. 15.—Result of closure of cleft hard and soft palate.
A. Mattress sutures. B. Relaxation suture.

easy matter to leave a strip of mucous membrane so that it will lie between the approximated edges.

(2) In addition to raw edges, it is necessary to have sufficient width to the raw approximated edges to give reasonable chance for union. This may be accomplished in the soft palate by cutting the margin of the cleft away far enough from the edge to develop a raw surface the full thickness of the palate. This is probably responsible for failures, in an effort to sacrifice as little tissue as possible. The necessary width of raw surface may also be had by splitting the soft palate along the edge of the cleft. Occasionally I have found it advantageous to combine these two methods.

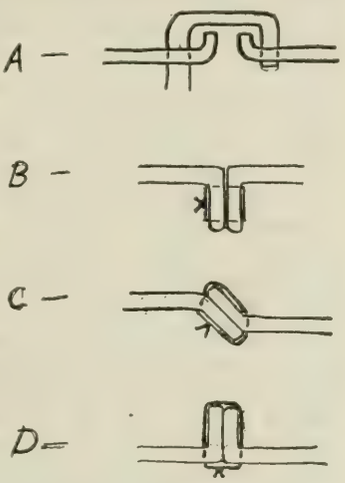

Fig. 16.—A. Mattress suture inserted. B. Mattress suture tied, approximating two raw surfaces. C. Round suture approximating mucous to raw surface. D. Round suture, approximating two mucous surfaces.

In the hard palate the mucoperiosteum is raw over its whole upper, or palatine, surface. Consequently no thickness can be developed, because it is not there. This deficiency is made up by approximating the edges in such manner as to infold them toward the mouth. If relaxation is sufficient, no difficulty will be encountered on this score.

Fig. 17.—Showing juncture of hard and soft palate.

(3) Relaxation is perhaps more necessary in cleft palate work than in any other class of plastic surgery. In most instances of plastic surgery some additional means may be devised whereby relaxation of the tissues may be established at, or maintained subsequently to, the time of operation. But in cleft palate work the greater the dependence upon immediate and thorough relaxation the more satisfactory the ultimate results. This can be accomplished only by thorough and careful dissection of the flap on either side until without tension it can be drawn across the width of the cleft.

(4) Sutures employed in my work are exclusively catgut, preferably chromic, mattress and close together. The mattress suture is used in preference to the round suture, because with the mattress suture one cannot fail, with the most ordinary care, to know that raw surfaces are approximated. With the round suture it is impossible to avoid getting an occasional approximation of raw to mucous surface or of mucus to mucous surface. Either of these means certain failure at that point.

One other point must be impressed in regard to sutures, which seems to be a rather frequent shortcoming in surgical work. While the mischief done by it in general work is often not so obvious, in plastic work frequently, and in cleft palate work universally, it causes trouble. This point is the tightness with which the tissues are grasped in the encircling suture. It is easy to get the habit of tying sutures tightly as if they were ligatures. In ligation the purpose is to cut off circulation in the vessels embraced. In sutures, the purpose is to approximate the tissues, cutting off as little of the circulation as possible, so that these vessels may perform their vitally important work of healing. If the sutures are close together and tight there must result complete failure. If one is too tight there will be a corresponding failure.

(5) After the operation liquids only should be given, and all care should be exercised to avoid use of the muscles of the soft palate. Sneezing, coughing, crying, talking and the curiosity of surgeon, nurses, assistants, parents, friends, to see how the wound is looking are among the finest measures I know to guarantee a failure.

Leave the wound alone and let it heal. If failure, partial or complete, occurs, try again.

DISCUSSION

Dr. J. Shelton Horsley, Richmond, Va.—The principles Dr. Bryan has laid down are much more important than carrying out his exact technic. Mobilization, so that the parts come together with no tension, is absolutely essential. The incision is made as close to the alveolar arch as possible. Sometimes I find in cases that have

been operated upon that the periosteal elevator makes too much trauma, and in those cases I use a sharp-pointed knife, slipping it in and cutting the flap.

In some details I differ slightly with Dr. Bryan. Instead of the suture material he employs I use fine silver wire. Every now and then we rediscover things and I have recently been more impressed with the real research ability of Dr. Marion Simms than I was before. If you use the fine silver wire he first used in vesical fistulae and put the stitches in with just a simple interrupted stitch, with complete relaxation, they can be untwisted if necessary or they can be made more snug with a simple twist of the wrist. They are also antiseptic and I leave them in for two weeks or more. Another advantage is that I think I can apply them more rapidly than I can the catgut or silk, and of course it is not a culture medium.

We frequently use too much "banjo work" about these cases. I have tried various methods of relaxation stitches of the soft palate, but have gone back to the principle Dr. Bryan brought out: to obtain good exposure and broad raw surfaces on each side, then put in as few stitches as possible and tie them just tightly enough to secure approximation. In some cases where there is tension it is well to pack one side with iodoform gauze in the relaxation incision for a few days. It is not well to pack both sides, for that interferes too much with nutrition. Packing on one side, while it obstructs nutrition a little, will still permit good drainage and good nutrition.

Dr. C. W. Allen, New Orleans, La.—All of us who have had experience in this field are constantly changing our ideas. The plan which I now use I have been following for the last few years. The general remarks the Doctor made should guide us in any procedure. Absolute relaxation of the flap is one of the essentials. One change I make is in regard to the time of operating. I usually begin as early as the child can stand any trauma, usually at four or five months. The operation is done in different stages. If there is a complete cleft I never attempt more than the soft palate at the first operation. I inject an adrenalin solution at the anterior palatine foramen in front and at the posterior palatine behind. The adrenalin is always put in an anesthetic solution for the control of hemorrhage. Sponging the patient's throat out is a great nuisance. In this way you can work much more rapidly and save blood to your patient. I never close the lip until the last thing: the soft palate first, next the hard palate and then the intermaxillary portion. In closing the lip before the intermaxillary portion you do not have the same opportunity for approximating the bones. You find in getting back in the hard palate you have difficulty in closing that small sinus-like opening, and often you have a little leak which is difficult to get at. I have adopted silver wire exclusively for suture of the palate. I find the patients will break the line of suture with other things. You cannot stop it, but if you put in a little silver wire you get results. It may be a little hard on the child at the time, but for the future results it is best. You hold both ends of the wire with a pair of forceps, slip another along the wire close up to the palate, holding the wire here while with the first forceps you make a few turns, allowing a piece a fourth of an inch long to project down. No child will put its tongue on that kind of suture.

I wish to call attention to a method I first saw used by our chief, Professor Matas, and that is used just after birth. Dr. Matas has devised a strong steel spring an inch or so wide that goes around the child's head. It is held in place with a cap and has two pads that fit under the malar prominence. The child wears this for months and it is wonderful to see the amount of approximation that can be brought about by this means. The gap is often reduced one-half by the time you are ready to operate.

Another thing is to keep these cases clean. I found that a small sized vaginal douche nozzle acts nicely. The advantage is that all the openings are along the side and you can irrigate with boric acid or anything you wish. It is well to do this a dozen times a day, if necessary. It should always be done after nursing.

Dr. Joseph E. Johnson, Memphis, Tenn.—I cannot agree with Dr. Bryan on the suture material he uses, catgut. It seems that catgut swells and makes a large opening in the tissues, and is a bacteria media. I have been in the habit of using either coarse horse hair or very fine silkworm gut suture. As has been brought out, the main thing is not to tie too tightly. With the horse hair the great advantage is that since it is elastic and not very strong, we cannot tie it tightly. The horse hair sutures have a tendency to come untied, but this can be overcome by putting in a few extra knots. This makes a rough surface for the tongue, which the children will avoid.

The high mortality among these children comes either from respiratory disease from having the mouth wide open, or from nutritional disturbance, through inability to swallow. They learn to let milk run down their throat and get it down in some way, but when the lips and nose are not closed they have not the power of suction which they need. I am in the habit, even during the first ten days of life, of pressing the jaws together with my thumbs and putting in a single wire which will hold the alveoli together and bring the lip and nose together at this time, leaving the cleft palate until a year or so later. They do much better in this way on account of their better nutrition.

There are two or three points that we must watch: first, we have no epithelium in the nasal side of our flaps from the hard palate. A good approximation is what we want.

In dealing with a cleft that involves a part of the hard and the soft palate, if we make the incision a little lateral, enough to allow the two epithelial edges to turn in and approximate on the nasal side and by long lateral relaxing incisions, we can slide the flaps across it and make an approximation, thus giving epithelium on both nasal and buccal surfaces. It is the epithelium that heals quickly and holds the flaps together. The soft tissues granulating together would not hold. I would insist upon the early closure of the alveolar process and the lip and nose. Even if you do not get the

lip perfect when these children are young, the advantage of the closure is enough to justify a shortening up of the lip at the time we do the cleft operation. I see no advantage in doing a partial cleft and dividing the operation into two stages. The only time that I would fail to draw a cleft together is where it would endanger too much the anterior blood supply. In that case I would leave a notch of the palate not in position. Later I could divide the whole thing and swing it around after the circulation was good from the other direction and after we had approximation from there back.

Another thing is that these children are subject after ether to an acidosis which I have learned to fear. I never touch them except when they are in the hands of a man who is competent to feed babies and take care of them. We do not operate upon babies who have an acid stool. Most surgeons do not know baby diseases and we must have a man who knows how to take care of them.

Dr. Bryan (*closing*).—The man who does cleft palate work does not know when he is going to change his method. We have all used lead plates and packing and all that, but underneath the whole thing, and that was the point of my paper, there are certain simple principles that must be followed out. If one man prefers to do the cleft first I have no objection. I prefer to do the front of the mouth first. If one man wishes to use silver wire I have no objection. I am getting just as good results with catgut as I could get with silver wire. It is a matter that you have to decide for yourself. I think we must often do two or three operations upon these clefts. I think it better to do the lip and the arch of the mouth or alveolus first. There is one objection; that you stand much less chance of doing the inside work if you do the front of the mouth first. If you make them look presentable and kissable they may not return for the completion of the inside work. That is the best reason I know for doing the inside work first.

RETROPERITONEAL CYSTS, WITH REPORT OF A CASE*

By J. Knox Simpson, M.D.,
Jacksonville, Fla.

If we leave out of consideration the solid tumors which occur in the retroperitoneal space, such as tumors of the kidney, the suprarenal gland, and the lymph glands (sarcoma and metastatic carcinoma) and still further eliminate the mesenteric cysts which have spread out the leaves of the mesentery and dissected up the posterior peritoneum, we have a comparatively small number of retroperitoneal growths falling into the class of true retroperitoneal cysts.

The origin of these cysts is rather obscure, the limited number reported in the literature having been ascribed usually to one of two origins: either from the remains of one of the fetal structures such as the wolfian body or duct or mullerian duct, or from some part of the retroperitoneal lymph system.

I have recently seen one of these cysts, which I wish to report.

Louise C., of Cocoa, Fla., a patient of Dr. Robert Schlernitzauer's, a child of six years, was referred to me on April 4 on account of a symmetrical enlargement of the abdomen which had attained such size that her respiration was being seriously embarrassed.

The family history was as follows: Her father and mother were living and well. Two brothers, 10 and 3 years of age, and one sister, 13 years of age, were in good health.

Past History.—The child was a forceps delivery, breast-fed, normal baby, with the exception of the fact that she had a congenital spina bifida, with a small, flat post-sacral meningocele. Her babyhood was normal in every way until she was two years of age, when her mother noticed that her abdomen was rather prominent. The abdomen continued to become gradually more prominent until the previous year, during which time the enlargement became much more rapid. For the preceding six weeks the mother stated that she had noticed that the abdomen had become much harder than it formerly was, and the child had for the first time been complaining of a sense of fullness and discomfort. She had become quite short of breath on exertion and ceased to be very active and playful. The child had always looked rather pale. She had had a good appetite. The bowels moved regularly. She slept well, and aside from the abdominal discomfort, seemed perfectly well. She had had no symptoms referable to the genito-urinary system except a very slight white vaginal discharge which had been present since birth.

Examination.—She was a rather well nourished female child. The skin and mucous membranes were pale and the lips somewhat cyanotic. The teeth were badly decayed and tonsils normal. The chest was normal in shape except that the costal angle was widened and the costal border flared on account of the abdominal enlargement. The lungs were negative. The heart was slightly enlarged and the beat rather tumultuous. The pulse rate was 120. The heart's action had apparently been considerably embarrassed by upward pressure on the diaphragm.

The abdomen was symmetrically enlarged to more than twice the normal size. There were numerous dilated radicals of the abdominal veins to be seen under the skin. Palpation revealed a hard, round, smooth tumor mass filling the whole lower abdomen and extending upward to a point

*Read in Section on Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

half way between the umbilicus and ensiform. The tumor gave to the palpating hand the sense of deep-seated fluid under tension.

Rectal examination gave no additional information. The tumor could be felt with the tip of the examining finger. Neither the uterus nor adnexa could be felt. The external genitals were normal. Catheterization was done and three ounces of clear urine obtained, the size of the mass not being affected.

There was a spina bifida present, and a soft, flat post-sacral meningocele about two inches in diameter, which did not increase in size nor become tense upon any expiratory effort which the child made.

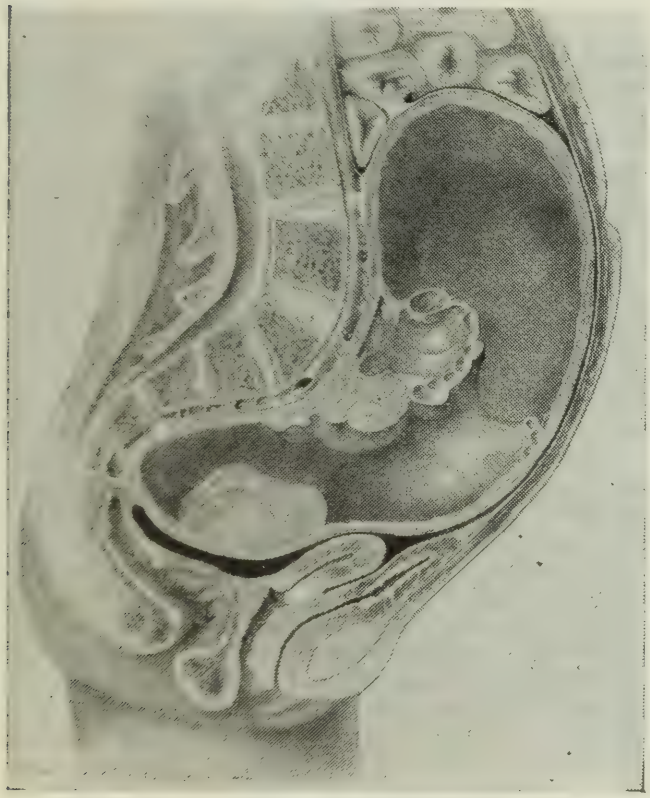

Fig. 1.—Cross section of the abdomen showing the extent and relations of the cyst lying behind the posterior peritoneum.

The lower extremities were normal. There were no enlarged glands in any of the superficial groups.

The blood examination was normal except that the hemoglobin was only 75 per cent. The Wassermann reaction was negative. The urine examination was negative.

Diagnosis of large ovarian cyst, probably a dermoid, was made, and operation was advised.

On April 8 the child was operated upon at St. Luke's Hospital, under ether narcosis. A midline incision was made from the umbilicus to the symphysis. Inspection showed a large retroperitoneal cyst the size of a large grape fruit, filling the lower abdomen, crowding the small intestines, stomach and transverse colon up into the upper abdomen, and the uterus and adnexa forward under the symphysis. Neither the cecum nor the sigmoid could be seen. The uterus and adnexa were examined and found to be normal.

The posterior parietal peritoneum, covering the cyst anteriorly, was incised and dissected away from the cyst wall. A trochar was then inserted and 45 ounces of a rather thick brown fluid evacuated from the cyst cavity. The cyst wall which was about one-half inch thick was found to be densely adherent posteriorly to the aorta, vena cava, iliac vessels, ureters, and vertebral bodies. The left ureter was dilated to the size of my forefinger. The removal of the sac was a very difficult and tedious procedure, the adhesions being so dense that sharp dissection was necessary to free it from the great vessels. This was particularly true where the cyst wall dipped over the promontory of the sacrum into the pelvis.

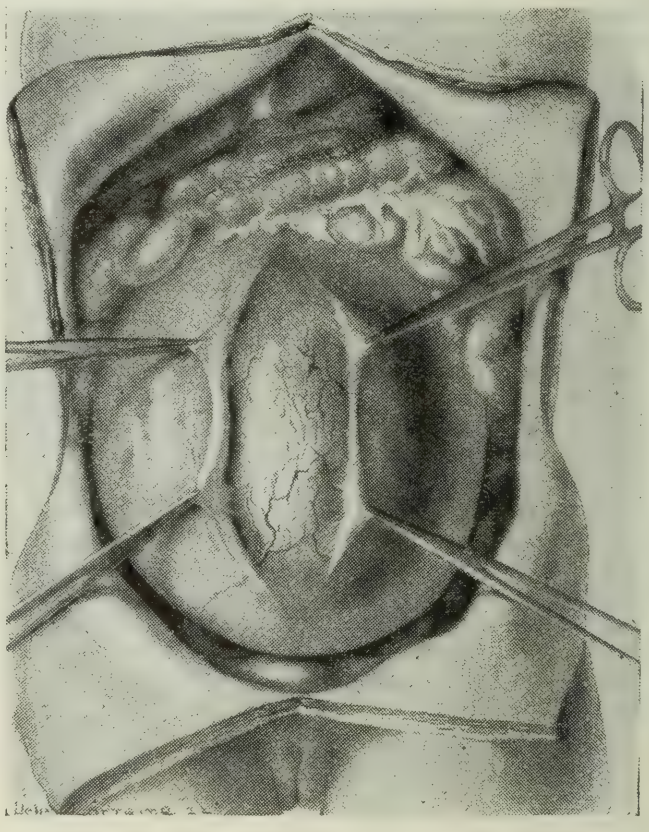

Fig. 2.—Anterior view of the cyst with the posterior peritoneal covering incised.

A good bit of blood had been lost from the oozing of the large raw retroperitoneal bed of the cyst at this stage of the operation and the child was not in particularly good shape, so the remaining pelvic portion of the cyst sac was left in place. The abdominal portion was excised, the posterior peritoneum closed around it, and the pelvic portion brought up to the abdominal wall and packed with gauze. The remainder of the incision was closed in the usual manner.

The child had a smooth convalescence without incident.

On the tenth day after the operation she was taken to the operating room, and with a short anesthetic the lining of the remainder of the sac was quickly and easily shelled out and a loose gauze pack inserted.

The child left the hospital on May 1, 22 days after the operation, with a clean granulating pocket, almost obliterated. The wound healed en-

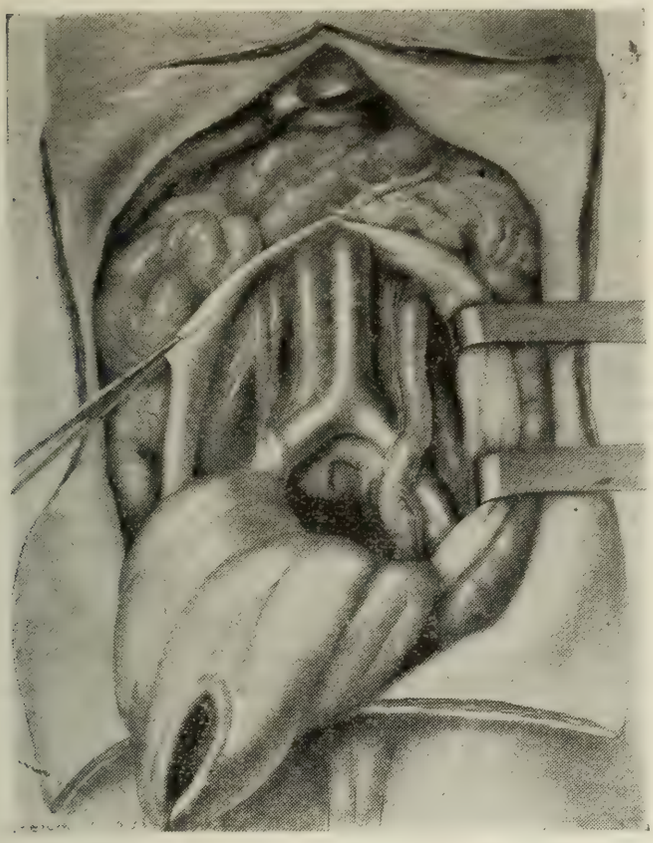

Fig. 3.—Fluid has been removed from the cyst and the sac is being dissected out of the retroperitoneal pocket. Note the distended left ureter.

tirely two weeks later and has remained healed, the child being apparently perfectly well. A let-

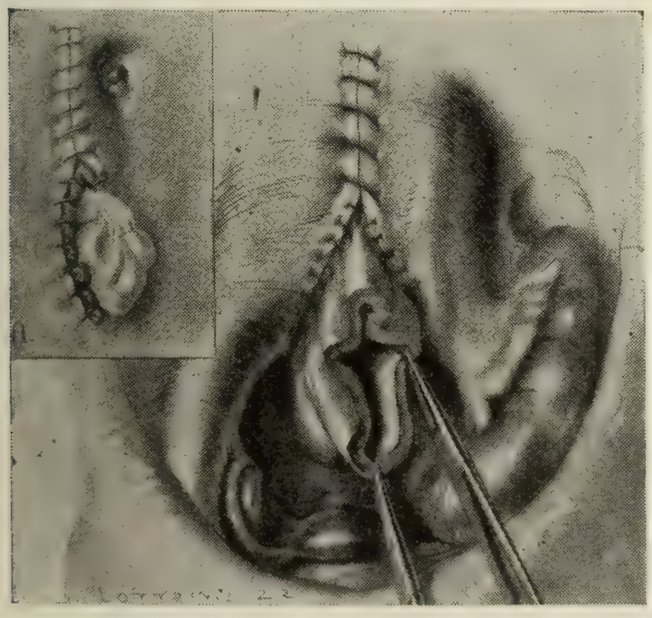

Fig. 4.—The major portion of the sac has been removed, the posterior peritoneum closed around the base of the sac and the sac brought up and sewed to the abdominal wall and packed.

ter a week ago from her mother stated that she was going to school and in splendid health.

A part of the resected sac was submitted to Dr. G. S. Graham, of Birmingham, Ala., for pathological study, who submitted the following report:

Gross Description.—The specimen consists of several masses of fibrous material having the appearance of pieces of a cyst wall. One surface is fairly smooth; the other is covered in places by a membrane-like layer of soft yellowish material. One of the masses shows a much thicker formation of this soft friable surface material, the layer reaching a thickness of 3 to 4 mm.

Fig. 5.—Lateral view of the patient before operation, showing the extent of the abdominal enlargement.

Microscopic Description.—Sections show a cyst wall made up of dense fibrous material. Its outer margin is compact, with few nuclei. The inner portion is somewhat looser and more cellular. The inner surface or cyst lining shows a superficial deposit of necrotic material with numerous leukocytes, many of which are disintegrating. Within the loose fibrous tissue of the inner wall and mingled with the necrotic material of the surface are frequent clear spaces outlining fatty acid crystals, many of which have been enveloped

in foreign body giant cells. No traces of epithelium are present. The wall contains occasional blood vessels and there is a moderate amount of old blood pigment occurring as brownish granules, particularly in the looser tissue of the inner portion of the wall.

Sections from the thicker portion of the wall mentioned in gross description show again a denser outer margin. The inner portion is made up of a loose fibrillar tissue with frequent cells. These are usually spindle-shaped, but occasionally more or less triangular or stellate. The looser tissue alternates with bands of denser fibrous tissue. There are occasional deposits of fatty acid crystals along the surface and in the inner zone of the wall, superficial areas of necrotic ma-

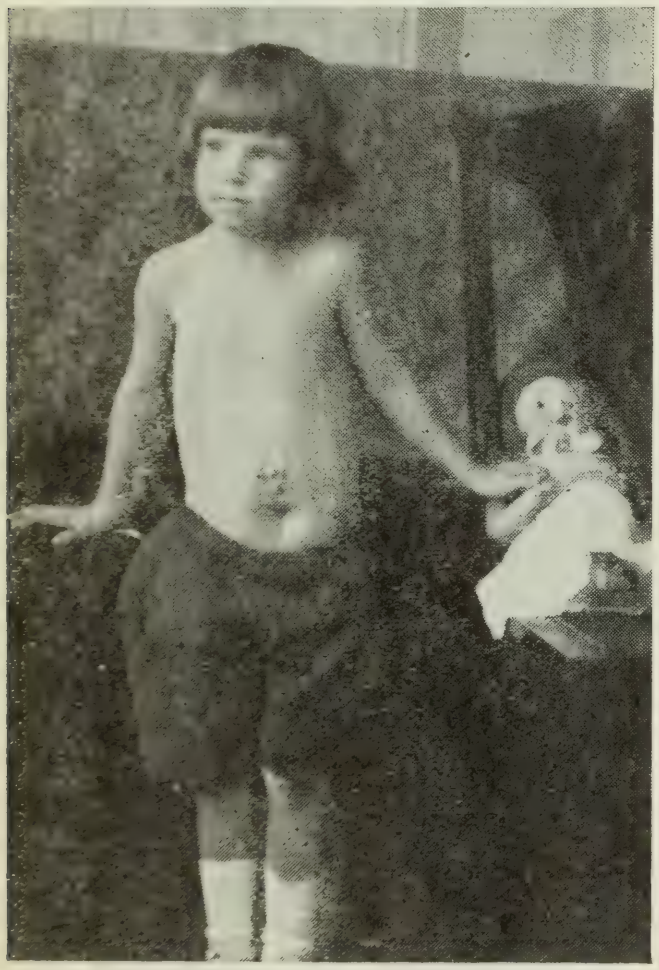

Fig. 6.—Patient showing abdominal scar three months after operation.

terial with many polymorphonuclears, and scattered throughout a considerable amount of old blood pigment granules. No traces of epithelium can be found.

Microscopic Diagnosis.—Fibrous cyst wall with slow necrotic changes of the inner surface.

Comment.—This is evidently a true retroperitoneal cyst. Unfortunately it fails to show any microscopic characteristics that help us much in explaining its origin. What little histology we have in the present tumor inclines me to the belief that this is a cystic expansion of a persistent remnant of the fetal urogenital tissues. This is vague, but I can come no closer to it.

This case has been of interest to me:

(1) Because of the rarity of these cysts.

(2) Because of the question which arose in the diagnosis of a possible connection between the post-sacral meningocele and the cyst.

(3) Because of the fact that it emphasizes anew the advisability and propriety of doing safely in two stages certain operations which cannot safely be done in one.

DISCUSSION

Dr. Frank K. Boland, Atlanta, Ga.—I have a somewhat similar case which I operated upon last week in a colored woman about thirty years of age. This was not a true retroperitoneal cyst, although it appeared to be so. I believe it was a cyst of the broad ligament which had pushed up to the diaphragm, pushing the peritoneum in front of it. At the time of operation it contained four gallons of clear fluid.

This fluid is usually brown or straw-colored, but in this case it was as clear as water. We measured three and a half gallons and probably half a gallon was lost. This had been diagnosed an ovarian cyst, but we found it was retroperitoneal. We could easily separate it out by peeling away the peritoneum. It came out easily, there was no attachment anywhere, and it was necessary to tie only a few veins that spread into it. There was no pedicle. She had four or five fibroids in her uterus and it would have necessitated a hysterectomy to remove them, but we had the good judgment to leave the fibroids alone, for she had stood the operation well and we felt that the fibroids could be taken care of later if necessary.

THE POST-OPERATIVE CARE OF URINARY CASES*

By Arthur L. Chute, M.D.,
Boston, Mass.

It is my belief that in no class of cases is the after-care more important than in operative urinary cases. It not only makes the greatest difference in the rapidity and comfort of the patient's convalescence, but often I believe it is the determining factor in whether or not he gets well. While it would be quite impossible for us to consider this subject in its entirety, there are certain points regarding the post-operative treatment of cases of this sort that I feel

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are especially important and which I wish to present for your consideration today.

The point that I believe is of the greatest importance is the post-operative management of the renal function, and I shall consider this first. No matter how careful we have been of our pre-operative treatment, no matter how well the kidneys have been working, as indicated by our functional tests, no matter with what care we have selected our anesthesia, there are a certain number of urinary cases in which operation is followed by a dangerous diminution of the renal function. The recognition and treatment of this, I believe, constitute the most important point in the post-operative care of urinary cases.

This condition is seldom met in general surgical cases. Its occurrence is almost wholly limited to urinary surgery since general surgical cases rarely show any element of back pressure, a factor which greatly predisposes a kidney to this post-operative shutting down. One seldom sees this post-operative interference with the renal function, even in urinary cases, unless there has been long-standing renal back pressure, such as results from obstructive disease of the lower urinary tract, as, for instance, that seen in stricture, prostatic obstruction, and such tumors of the bladder as cause obstruction to urination.

It has seemed to me that the process on which this post-operative renal insufficiency depends is, in its commonest and least complicated form, simply a passive congestion, the result of circulatory changes that follow the removal of the back pressure against which the kidney has been forced to accustom itself to work. It is evident that back pressure from an over-distended bladder is transmitted to the kidneys even through ureters that are not dilated. That this interference with the renal function may be the result simply of the removal of back pressure seems probable from the frequency and sometimes the rapidity with which it follows the suprapubic opening, under local anesthesia, of a bladder overdistended with uninfected urine. While this passive congestion may be the only process present in a considerable number of cases of this post-operative insufficiency, I believe that this passive congestion is often complicated by a renal infection, either a recrudescence of an already existing pyelonephritis or by a new infection. Finally, I believe that in some cases where the patient has had ether there is engrafted upon either the passive congestion alone or the combination of the passive congestion and pyelonephritis a toxic process due to the injury that ether is known to exert on injured renal cells, as evidenced by the conditions that we see resulting from the administration of ether to patients with nephritis. There is indeed suggestive evidence that renal cells do not necessarily have to be injured to suffer from ether.

As a result of this injury to the kidney, no matter what the type of injury is, the kidney fails to do its usual excretory work and the patient becomes toxic, due to the accumulation in the body of waste products. The condition is usually evidenced by a dry tongue, foul breath, nausea and vomiting, hiccough, soft distension, delirium, and finally coma and death—surgical uremia. The blood examination shows an increase in the non-protein nitrogen and urea nitrogen, evidence of the retention of waste products.

We naturally look for an explanation of this condition and clinical observations make it seem probable that the explanation is that kidneys in this condition cannot strain the waste products from a blood of normal concentration. That these kidneys are not worn out but are simply temporarily incapacitated seems proved by the fact that in instances of this sort, when very little urine is being excreted, the introduction of fluid into the blood stream will often start a free excretion of urine, as though, while the injured kidneys could not handle a concentrated blood, they could handle very easily a more dilute one.

The recognition of this condition, which ordinarily develops one to three days after operation, should be easy, but my experience has been that it is often looked upon as something else: sometimes as delayed shock, sometimes as hemorrhage, since there is so often a little oozing in operations of this type; again it may be considered as some vague cardiac complication. The recognition of this condition is important because, though often fatal if not

recognized, the outlook is fairly favorable if recognized early and treated vigorously. As a help to the early recognition of this condition I insist upon the keeping of a urinary chart in all post-operative cases: a diminution in the amount of urine is an early, if not the earliest symptom. Vague symptoms, such, for instance, as soft distension of the abdomen, should arouse our suspicion, and if this is found in the presence of a small excretion of urine, it is very suggestive of insufficient renal excretion. The same may be said of hiccough. Both of these conditions will ordinarily be remedied by the introduction of large amounts of fluid.

To combat this type of renal insufficiency water must be introduced into the circulation in large enough quantities to allow the kidneys to have a sufficiently dilute or non-viscid blood so that they can extract the waste products from it. This may be accomplished in the mildest cases by pushing water by mouth, a glass an hour, when the patient is awake. Because of the nausea and vomiting it is not, however, of use in the more marked cases. The use of salt solution by rectum is helpful in mild cases, but in cases where the condition is at all marked we must have recourse to salt solution under the skin. This must be given in such amounts as are necessary to allow the injured kidneys first to disintoxicate the patient and thus to keep him free from toxicity, and for so long a time as the kidneys need this help. In this connection it must be remembered that we have kidneys suffering from temporary disability, the probable duration of which is from a few days to a week, but which may go for much longer, since kidneys whose cells are incapacitated by an inflammatory process or a toxic degeneration do not recover as quickly as those simply embarrassed by a passive congestion. Our object must be to keep the blood dilute until such time as the kidneys have sufficiently recovered to handle a blood of normal concentration. This may mean giving a patient 750 to 1000 c. c. of fluid three times a day for days and even weeks. I have had to have it given three times a day for four weeks before a patient, now living and well, could get along without it. There is no definite indication of the amount to give, whatever is necessary to disintoxicate the patient and to keep him free from toxicity. In one case the amount given was such that the patient excreted 463 ounces of urine in one 24-hour period. This was an unprecedented amount in my experience, but it may be necessary to get the output up pretty high to disintoxicate some patients. The time over which it must be given is not to be reckoned in days or weeks, but until the kidneys can handle a normal blood. If one stops too soon, there will be a relapse; usually all that is necessary under such conditions is that one take up the treatment again. One should remember that the renal condition is a remediable one; that if the patient can only be tided over for a time his kidneys will take up their work and he may go on for years in good health.

In some patients the giving of enough fluid so that embarrassed kidneys will be able to keep a patient free from toxicity will be more than the patient's heart can stand. The first sign of this will usually be edema of the scrotum, though I have seen instances where the first intimation was an acute cardiac dilatation. The appearance of edema is evidence that the limit of the patient's ability to handle water has been reached. In cases that show any evidence of valvular disease or muscular degeneration digitalis and other stimulants should be started early. Cases of this sort often require the most careful handling to get enough fluid into the body to permit the kidneys to carry out necessary excretion and yet not to put a greater burden on the heart than it can bear; occasionally this cannot be done.

I cannot help saying just one word about the prophylaxis of this condition, in so far as it depends upon ether, for it has seemed to me that the worst cases have followed the use of ether; that is to recommend the substitution of spinal anesthesia for ether in all operations for obstructive conditions about the bladder outlet; an entirely feasible thing, I believe.

The above condition seems to me by all means the most important that we have to meet in the post-operative care of urinary cases, and for this reason I have gone into it with a good deal of detail.

Many of the operative conditions with which we have to deal in urinary surgery demand drainage. I would say, in fact, that the great majority need it for one reason or another: some because there is suppuration; others because the operative field has been contaminated, some again because of hemorrhage. Drainage is so necessary a part of urinary surgery that its careful post-operative management seems to me to be of the utmost importance.

It is my experience that in spite of its importance many men have no well formulated rules for their guidance as regards the management of drainage and act often from impulse rather than from any definite plan.

The post-operative management of drainage must necessarily depend somewhat upon the purpose for which it was used. Thus we use drainage in some cases to control bleeding, while in other cases, and these constitute by far the greater number, we use drainage because of the presence of suppuration or because of a fear that a wound has been contaminated. In certain other cases the object of drainage is to put an organ temporarily at rest. Naturally the management of drainage differs somewhat according to the purpose for which it is used.

Drainage for the control of hemorrhage is even used in different ways. In some cases, more especially where cavities like the bladder or kidney pelvis are involved, drainage by means of tubes is employed. It accomplishes its end first by putting the organ at rest and second by carrying away any blood as fast as it escapes from the vessels. This prevents distension of the cavity by clot, which in turn tends to open the mouths of the oozing vessels and continue the bleeding. This drainage does not exert any positive hemostatic action on the open-mouthed vessels, but by keeping the cavity free from blood and at rest, it gives Nature the best chance to seal the vessels. The importance of this method of controlling bleeding has been especially impressed upon me by several instances in which it was not used. These have been for the most part cases of nephrotomy that have been closed without the safety valve that a small drainage tube gives, with the result that they have oozed until it has been necessary to open the wound and either do a nephrectomy or reclose the kidney after providing proper tube drainage for the pelvis. In these cases the kidney pelvis has been distended with clot; clots have protruded from the edges of the kidney incision; the whole condition due, I believe, to the fact that the ooze was not carried away as fast as it accumulated, which led to distension of the cavity with clot and the continuance of the bleeding. Drainage of this sort, which, as I have said, is ordinarily by tube, may usually be removed as soon as the urine is pale red, though it is safer to wait until it has ceased to be red.

When a cavity has been packed with gauze to control more serious bleeding, usually a sharp venous ooze, it is wise to let the packing remain for a time after all evidence of bleeding has ceased, to be sure that the vessel mouths have been well sealed; the removal of gauze is much more likely to start bleeding than the removal of a tube; so much so that sometimes, unfortunately, the packing must be replaced. We often see a rather free oozing follow the removal of packing from a kidney or bladder, but it usually ceases in a few moments. It is the result of the tearing of granulations entangled in the meshes of the gauze.

While the use of drainage is important in the control of bleeding, our greatest use for it is in the treatment of suppurations and infections. As a broad rule, drainage which is put in because of infection, whether it be done by tube, gauze or rubber wick, should be allowed to remain until the temperature is flat. A normal temperature may usually be taken as an indication that the wound, which at first was an absorbing surface, has changed from an absorbing surface to an excreting surface. If one waits until this occurs, no matter how long it may be, it will be safe usually to remove drainage. There is, however, an exception to this rule in that a wound which is bottle-shaped should be drained for a considerably longer time than until the temperature is flat. Drainage should be kept up until such time as there has been a considerable contraction of the deeper part of the wound. This may be roughly

estimated by the relative decrease in the amount of discharge. If this is not done, following the removal of the drainage there may be a blocking at the neck of the cavity and an accumulation of septic material in its depth levels. As a rule a secondary accumulation of this sort is not so dangerous as an infection immediately following operation. Very often an accumulation of this sort reopens itself though it is wiser not to wait for this, but to make a careful and judicious effort to find and open the pocket. One is less likely in my experience to have a septicemia following this backing up than he is to have a septicemia immediately following operation when adequate provision for drainage of an infected wound has not been made. This backing up not infrequently follows operations about the bladder base where we attempt uphill drainage from the depths of the pelvis. While we often get along well enough with this type of drainage, I believe the big pelvic veins render uphill drainage of the deep pelvis risky. It does not actually come within the scope of my title, but I wish to urge that drainage of the pelvis be made dependent in every instance where this is possible. I use more and more in cases of suppurative pericystitis and contaminated wounds deep in the pelvis, at the level of the bladder base, a simple procedure that is not so generally used as I think it deserves to be. To establish this drainage one pushes a large, curved clamp down through the muscles that form the pelvic diaphragm, directing it a little to one side of the median line of the perineum. When one feels the tip of the clamp under the skin he makes an incision over it, pushes the clamp through, grasps a tube in its jaws and pulls the tube up into the pericystitic cavity. This gives excellent drainage of the lower part of the pelvis. With this type of drainage there is hardly the possibility of backing up. The tube should be slowly shortened after the temperature has reached normal.

In the drainage of certain over-distended bladders and especially in the drainage of certain kidneys, our main object is neither the control of hemorrhage nor the drainage of infected areas, but to put the organ at rest and to allow a contraction of the drained cavity to take place. I believe that in cases where a kidney stone of any size has been removed, especially if this has been done by nephro-lithotomy, it is an extremely important prophylactic measure to allow drainage to remain for a considerable time. This allows the cavity in the kidney that contained the stone to contract as much as possible, an important point in preventing a recurrence. Any cavity filled with stagnant urine, even if this is uninfected, predisposes the patient to a reformation of his calculus. For the same reason a kidney pelvis that has been distended with a large stone should have a long period of drainage, provided this drainage is through the kidney cortex. This is to allow the distended muscle of the pelvis to contract and regain its muscular tone, since if it remains dilated or flabby, there is sure to be a recurrence of calculus. If, in such a case, drainage of the pelvis has been carried out by means of an incision in the pelvis itself, rather than through the cortex, long drainage by means of a tube is very apt to be followed by the formation of a sinus.

While the drainage of a suppurating area or cavity, provided that this does not involve a natural cavity, like the kidney pelvis, ureter, bladder or urethra, may be kept up almost indefinitely without the formation of a sinus or fistulous opening, we must be careful about the length of time we allow drainage that connects with a natural cavity to remain. The only rule I can formulate regarding this is a very vague one and that is, the thicker the wall of the organ the longer we may allow drainage to remain in place without the formation of a fistula. Thus one may drain a kidney pelvis through the cortex many times as long as through an incision in the pelvis itself without danger of the formation of a permanent fistula. So, too, in suprapubic drainage of a bladder, the thicker the abdominal wall, the longer the tube may remain without the formation of a fistula. In the same way, the deeper the perineal tissues, the less danger that drainage will be followed by a perineal fistula. In a thin perineum, drainage must be removed early. My remarks presuppose that in any instance of drainage of a cavity no obstruction exists lower down in the urin-

ary tract. Should such obstruction exist, a fistula is almost sure to follow drainage of a cavity of this sort. Should the cavity drained be tuberculous, whether kidney, ureter or bladder, there will be a great probability that a fistula will remain for a very long time, no matter how well one manages the drainage.

While many other problems come up in the post-operative care of urinary cases, lack of time forbids any attempt to discuss them. I believe, however, there are no other problems in the post-operative care of urinary cases that are as important as those we have considered; no others perhaps in which the methods commonly employed in the post-operative care of general surgical cases have to be so much modified to meet the particuar needs of urinary cases.

DISCUSSION

Dr. Edgar G. Ballenger, Atlanta, Ga.—I am sorry that time did not allow Dr. Chute to go a little more into the preliminary treatment these patients require, for a good part of the post-operative treatment should begin before operation. This is especially true in the management of the kidney function. I think the reason the urologist gets a lower mortality rate in these cases is because he devotes more time to the pre- and post-operative care of his cases. Another thing is that the urologist has to be a plumber as well as a good surgeon if he is a good urologist. I quite agree with Dr. Chute that there are few things of more importance than large quantities of water, started before the operation and continued after the operation. If one is operating in a hospital where they are unaccustomed to our methods, they may think the urologist has lost his mind when he insists upon free water immediately after operation. They think that in an abdominal operation water is bad, and unless one insists upon it, one finds that they will not give the patients enough water, coffee, tea, orangeade, etc. It is no great tragedy if the patient should vomit. It will only wash out his stomach. Then the fluid can be discontinued and after a time commenced again.

One valuable thing Dr. Chute did not mention is the use of alkalies. I make this statement after having used them for fourteen years. The patients are alkalinized before the operation and it is continued after the operation. At times you may fear infection, and in those cases you may have to substitute hexamethylenamin instead of alkalies. If there is fear regarding the kidney function we give the alkalies. If we fear infection we change to the hexamethylenamin. We are usually more afraid of the renal function.

Dr. John T. Geraghty, Baltimore, Md.—I think I can subscribe to most of the things Dr. Chute has said. I think we all appreciate the great value of water. For a number of years at the Brady Institute we have insisted that our patients get large amounts of water, and if you have seen these patients recover from uremia under this large volume of water you are sure of its value.

There is one thing that I must take exception to, and that is the essayist's explanation of the reason why water is valuable. I did not know it was possible to reduce the viscosity of the blood by taking water even in large quantities. My explanation is that it washes out the pus from the tubules of the kidneys. If you establish drainage, as you will by large quantities of water going through the kidneys, you necessarily increase and re-establish function. It is possible to increase the urea output by simply taking plenty of water. Congestion is mentioned time and time again as the cause of these conditions. In my experience they have been acute infection, of course associated with congestion, but you can get the most enormous grades of congestion with only slight reduction of renal function. In advanced cases of chronic nephritis with contracted kidney we are troubled with polyuria. Hence, even in the most advanced cases, the kidney still has the ability to take the water from the concentrated blood. This is just a matter of minor importance, for we all know that water is valuable. I was simply wondering if Dr. Chute had some explanation for his statement.

Dr. Abraham Nelken, New Orleans, La.—In cases of renal inactivity, or where we have reason to fear suppression, my preference is for glucose solution rather than salt solution. We have seen prompt renal response follow intravenous injection of a 33 per cent glucose solution. A common practice at Touro Infirmary is to use 5 per cent glucose solution instead of normal salt for hypodermoclysis. The advantage of the glucose solutions are that they contain food elements that saline does not; and, besides, there is the well-recognized renal stimulation of glucose that we are all familiar with as is exemplified in diabetes. Personally, I have been impressed somewhat by the recent literature on salt-free diet in nephritis as suggesting the advantage of other chemicals than sodium chlorid where renal failure is feared, although experience would suggest that this fear is rather more theoretical than real. I recently was in consultation in an interesting case of suppression following prolonged ether anesthesia that may be of interest if related briefly. This young woman had had a pan-hysterectomy done for double pus tubes. She passed no urine for nine days following the operation. I was asked to see her the day following the operation, for the first suspicion was that the ureters had been tied. Cystoscopy was a problem, for the patient could not be moved from her bed, and the entire anatomy of the bladder had been distorted by the operation. In addition, there was intense congestion of the mucosa, such as is to be expected following the trauma of the operation. My catheters went somewhere, but I was strongly inclined to the belief that they did not go up the ureters. Subsequent developments showed that they entered a fistulous opening in the vagina, although vaginal packs concealed this fact at the time. In

spite of all sorts of infusions and hyperdomyclisis, this patient passed no urine for nine days. Her mind was clear until the eighth day, when she showed evidence of uremia. She developed considerable anasarca. When the kidneys began to function, a great quantity of pale, clear urine was excreted and all symptoms promptly cleared. I think there can be no question that the ureters were not tied in this case, but that it was one of true suppression due to intense renal irritation from the ether. The course of this patient further exemplifies the distinction that has been often made between non-function of the kidneys and uremia. Here we have a patient going for eight days without secreting any urine and uremic symptoms developed only after a week of suppression.

Dr. George R. Livermore, Memphis, Tenn.—I promised Dr. Chute to take opposite sides with him, but he has taken the wind out of my sails by coinciding with my views. No one can doubt the efficacy of water; and with Dr. Witherspoon I believe in water "internally, externally and eternally." The more water we give these patients the better they do. Dr. Geraghty said that a congested kidney could go on and secrete urine. That is true, but if you have a damaged kidney as well as a congested one that is where we have trouble; but if water is given freely the damaged kidney can eliminate a dilute toxin where they could not eliminate a concentrated one.

In regard to drainage, I am rather inclined to disagree on draining through the parenchyma of the kidney. I think every time we cut into a kidney and leave a drain, we damage a good deal of the tissue and damage the kidney permanently. Consequently, if we can avoid drainage through the kidney substance it is better. I wash out the pelvis of the kidney after removing a stone in order to remove all calcareous particles, clumps of pus or blood clots that could be the nidus for the formation of another stone.

Dr. Wm. F. Braasch, Rochester, Minn.—I do not wish to underrate the suggestions made by Dr. Chute, for we all appreciate the value of forcing fluids in the treatment of surgical complications in the urinary tract. However, we must recognize the danger of giving too much fluid. An interne should not be allowed to inject an unlimited amount of saline or glucose solution into a patient who has lowered renal function. The administration of large quantities of liquids over a period of several days occasionally brings about cardiac collapse, and great care should be taken that the patient eliminates sufficient fluid in one way or another.

In a series of animal experiments, Rowntree has demonstrated that death may be caused by the administration of too much water into the tissues. It is evident, therefore, that too much fluid is occasionally as harmful as too little.

Dr. H. W. E. Walther, New Orleans, La.—I wish to speak on drainage in kidney operations. I made the statement last year that in my cases where the parenchyma or pelvis is opened I drained, and at that time some took issue with me. I feel that I am stepping on Dr. Braasch's toes to some extent, for at the Mayo Clinic they have popularized the primary suture of wounds, but I have not been able to get by with it. I have drained all my cases, as Dr. Chute brought out, and have drained for a long period of time with great satisfaction, and I propose to continue it. There are probably some cases in which primary suturing can be employed, but I cannot subscribe to it. I believe the pendulum is swinging the other way and we are now draining our patients more and we do not have to go in and open them up later.

Dr. Chute (closing).—As to Dr. Ballenger's remarks regarding the importance of preoperative preparation, I quite agree with him, but there are some cases where one cannot wait to prepare the patient properly. Some bladders are filled with blood; some cannot stand a catheter; others are too septic to make waiting seem wise. In these cases one must drain the bladder at once, and when you have to go ahead and open a bladder without preoperative care I believe the careful post-operative treatment can be made up largely for the lack of preoperative treatment.

I agree with the point Dr. Ballenger made about the disadvantage of working in hospitals where you are not acquainted. I think the keeping of a careful urinary chart is especially important under these conditions.

I have not used alkalies to any extent following operation. The other plan has seemed to work so well that I have not thought it necessary to use them. Perhaps I should.

Dr. Geraghty is not convinced that salt solution acts by changing the viscosity of the blood. I am not sure that this is the action of salt solution; I suggest it as a working hypothesis. However it may act, it increases urinary output, and the process of elimination and lessening the viscosity of the blood seems to me its probable method of action. I cannot quite agree with him that it acts by washing out the kidney and getting it free from pus. This washing of the kidney cannot take place until the dilution of the blood allows the glomeruli to function.

I cannot account for Dr. Nelken's patient who began to secrete urine after nine days of annuria. There must have been some temporary trouble with the renal cells. For some unknown reason this patient did not become fatally toxic before the kidney cells recovered their ability to function. I cannot explain the condition.

I am going to take Dr. Livermore's maxim home—"water externally, internally and eternally." It is a good maxim and I am deeply obliged to him for it.

I touched a little on the matter Dr. Braasch spoke of, that is, overdoing the use of water. I have seen a few such instances. I have seen acute gastro-mesenteric ileus follow the too liberal forcing of water. I have also seen what I took to be acute cardiac dilatation follow this. I think, however, it is poetic justice that it remained for a man from Minnesota to discover that an excess of water intoxicates.

I am glad that Dr. Walther agrees with me about the advantage of draining a kidney through the cortex. I believe the better drainage more than compensates for the increased risk that undoubtedly follows incision through the kidney cortex. If one has a badly diseased kidney it should be drained and drained efficiently. A big tube right down through the cortex drains it better than any other way.

THE TRAINING OF AN OBSTETRICIAN*

By Calvin R. Hannah, M.D.,
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The present training of a medical student differs materially from that of the past. The prospective student enters the medical college with the minimal requirements of a high school education and an additional two years of college work. This period of training, when properly directed, prepares him so that he should be qualified to assume the responsibility of his medical career. A good high school training and two years of university life should develop, rather than destroy, the initiative of the individual.

The teachers in high schools and universities are public leaders who are specifically trained for the development of the youthful mind. They have good pedagogic principles, cultivating and training the student to individual activity, which creates in him an incentive and ambition in his systematic pursuit of knowledge. They labor to unfold his spirit of self-reliance, responsibility and resourcefulness.

In this early training three principles, memory, observation, and comparison, should be cultivated and thoroughly developed. An excellent and retentive memory is an invaluable asset in the medical career, for one must constantly refer to those things which have been taught. Observation is equally important in the training of the mind. So often one neglects concentration and does not detect all the minute and accurate information necessary to establish a mental picture of value. By comparison one discerns the similarity and dissimilarity of an object by calling his memory and observation into action and noting the relation between this and previous experiences. When properly developed and persistently used, these three factors lay the foundation for a medical training that will meet with success.

The curriculum varies but little in the medical colleges. The work is so planned that the first two years are spent principally with purely scientific subjects. The work is more or less abstract and the methods of teaching sometimes have a tendency to destroy the individuality of the student. The medical teacher should be of a type which has the ability to mold character, train the mind and lead the student through this critical period without stunting his imagination or destroying his initiative, but rather instilling in him resourcefulness.

The pre-clinic period is filled with both adversities and opportunities for the medical student. His career is largely made or ruined during this molding age. These teachers are scholarly men with character who silently lead and direct the student to high aspirations for service. Teachers who are qualified in their special subjects may, by their untiring service, impress the student with a burning desire not only to follow his leaders, but to forge ahead into fields of research. The student should be taught anatomy, physiology, pathology and other pre-clinic branches with the idea that he will like one a little more than the others, yet be proficient in all. The one he prefers may be emphasized during his clinical years and pursued with pleasure after he has selected his specialty. This gives him the spirit of resourcefulness, which, in his work, will react as an invaluable asset to carry him on to greater activity. It may be chemistry or pathology; but whatever it is, he should come into his clinical years with an idea of advancing some one research line which is closely allied to his selected subject.

When possible, the pre-clinic subjects should be demonstrated by clinical material. Whenever feasible, unnecessary dry facts should be culled and methods of interest and living clinics should be substituted to make the subject real. Much of the work taught in the medical schools is soon forgotten, due probably to the fact that abstract methods are employed and the truths are not cemented with clinics.

The teaching of the pre-clinical sciences should be demonstrated by that method which leaves with the student the correctness of thought and the application of those principles to human life. This method establishes in the student's mind confidence, because he not only sees in the lab-

*Chairman's Address, Section on Obstetrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

oratory the actual pathology, but by witnessing the symptoms, he has developed a comparatively good idea of the method of diagnosis. Here, again, is exemplified the necessity of memory, observation and comparison.

Why lecture so long to students on some parts of obstetrics when, by the use of clinics, it could be demonstrated and taught more successfully and in much less time? One hour in demonstrating the signs and symptoms of pregnancy by the senses of sight and hearing is far more valuable than several hours of lecturing. The patient, in the presence of the student, touches a new chord, awakening in him an interest surpassed only by more clinics. It excels all text book work. Let the patient describe in her own manner her symptoms. Who can be more effective and impressive than the patient? She makes an ideal teacher. The language may not be so charming, or the thought so illuminating, yet spoken only as a patient can, and supplementing this with a teacher who has the art to lead his patient to describe her symptoms carefully, it will leave with the student a knowledge of the subject which he will not forget, and which has become a part of his life. He has unconsciously been influenced by that unseen force exemplified by the ideal teacher, the art of medicine. The art of medicine, that silent force of the clinical teacher, creates more energy, fashions more individuality, produces more activity and constitutes more resourcefulness in the student than his scientific ability. The clinical professor's attitude toward his patient is a force unseen, yet all-powerful in influencing the life of a medical student. It may ruin the prospective doctor or so mold him for good that his influence will be immeasurable.

In the clinical years, whenever possible, the student should be permitted actually to work with the patient. His training will otherwise be incomplete. In obstetrics it is most valuable. It is impossible to develop otherwise. Instructors who are efficient and enjoy teaching believe they have a service and a mission to perform and are more interested in molding the life and in developing well trained obstetricians than in making a commercial success. Service to mankind enhanced by qualifications of the highest type are assets absolutely essential to the character of teachers and doctors who are to train medical students and internes.

Obstetricians cannot be properly trained and educated unless our medical colleges have adequate laboratories and hospital facilities. Students advance more rapidly and develop more thoroughly in such an environment and atmosphere. The best training is given in that institution which is closely allied with a hospital that furnishes a variety of clinical material sufficient in quantity to supply the student enrollment. Dispensary and outdoor service are very essential, because it is that sort of practice the student experiences immediately upon leaving college. This department, properly supervised by physicians and teachers of worth, will develop the resourcefulness of the student and find in him latent powers which, if encouraged and nourished, will naturally inspire him to higher aspirations.

Well organized and conducted clinics influence students to accept interneship. Internes who have responsibilities, and opportunities to work independently under correct supervision, soon find in themselves an earnest desire for something high and good. This aspiration will create a desire for further preparation and stewardship for resident obstetrician, which should carry greater responsibilities, opening a new era in his preparation for more difficult and operative work. The resident obstetrician should be a competent diagnostician, adept in pathology, proficient in surgery and skillful in obstetrics.

Credit for success or failure, responsibility for diagnosis and treatment, teach principles of medicine more forcibly than lectures or recitations. The recitation system is practically useless in developing self-reliance and any initiative in the student. We should encourage him to rely upon himself and trust his own power of judgment, which will eventually train him in the feeling of security and self-confidence. Enthusiasm of youth and responsibility make a great combination for an ideal foundation in the training of an obstetrician. All through the course as student, interne and resident, he should have the advantage of these clinics, doing the

actual work before and after deliveries, both in the hospital and in the home. These cases should be reported completely in a systematic manner. corrected, graded and reviewed personally, or in class conference, so that not only the student but his associates will profit from his successes as well as his mistakes. Courage, power of responsibility, devotion to duty and valuing properly one's powers are the basic principles upon which a well-trained obstetrician thrives.

The day has long passed when students were taught more about the "Milky Way" than the "way to milk." So today we should not spend all our time teaching how mothers give birth to their babies, but rather train the student to conduct labor, to lessen pain, relieve suffering, lower morbidity and mortality, and elevate obstetrics to a standard commensurate with the service justly rendered. Unless we teach and train the student for obstetrical service of this sort, his opportunity to serve society will avail little. He must be prepared to render efficient service. This is keeping faith with the public.

No one has the right to teach who lacks the sense of service. It is the spirit of doing for others that wins. No real teacher is content to give out information, to impart knowledge. He wants bigger things, stimulating, wholesome thoughts, to urge students on from the known to the unknown, touching and kindling the spark of imagination necessary to all progress, developing self-reverence and self-mastery without which no one is properly trained.

"Without inspiration the best powers of the mind lie dormant. There is tinder in us that needs to be quickened with sparks." Life at its best is filled with a strain of monotony and we, as teachers and physicians, must be sources from which the student receives inspiration that he may rise and not fall, that he may grow and not shrink. "Give the best we have, and the best will come back to us." We should be inspired to build character and make the world a better place in which to live.

Francis B. Pearson in these few words states the powers of a teacher in the training of youth:

> "He leads them toward the summit whither life beckons. Sometimes the way is steep and the path rugged. Sometimes they slip and stumble and fall, but he is there to lift them up and speak words of cheer that give them heart and hope again. When one grows weary or faint he knows the magic words to speak. He sees the fleck of sunlight just ahead and points it out to them to restore their waning courage. When heat and thirst assail he leads them to the spring that bubbles forth its welcome. Then they renew their journey with a song and the summit seems not far away. Sometimes they look toward the delights they left behind, but soon he has them anticipating the joys at the obstacles they have passed and the hardships they have borne."

Teachers of ability and character must direct the student through his early preparation, encourage him to accept service as interne and resident, inspire him with an ambition to live a useful life, counsel him to make use of his opportunities, implore him to add his little bit to raise the standard, and teach him that it is not the man that counts, it is his work. This is training an obstetrician.

EYE, EAR, NOSE AND THROAT

SOME OBSERVATIONS ON AURAL CONDITIONS RESULTING FROM POOL AND SEA BATHING*

By H. Marshall Taylor, M.D.,
Jacksonville, Fla.

The frequent occurrence of various aural affections during the summer months has occupied a very small part in the literature of the otologist. When one reviews one's case histories, one discovers that a large percentage of ear and sinus infections during the summer time can be directly attributed to pool and sea bathing. Our recent American text books on otology give a casual and brief reference to what is termed the salt water ear, and with that the subject is usually dismissed.

In reviewing the literature, however, I learn that the sanitarians have been far more alert to the importance of this phase of medicine than the students of otology. The American Public Health Association has done a vast amount of work during the past three years, which consists of statistics and information on the sanitation of public bathing places and the improvements which have been instituted. Just what sanitation can do was forcibly impressed on me when Mr. George W. Simons, Chief Sanitary Engineer of the Florida State Board of Health, became interested in a public bathing pool in my city. In the summer of 1917 I observed an epidemic of acute external ear, middle ear, mastoid and sinus infections. All of the patients gave a history of having used a public pool in Jacksonville which had been under careless and indifferent management and which several times had been closed by the State Board of Health.

At Mr. Simons' instigation, the management of the pool was changed, and after a thorough inspection many reconstructive changes were made. An adequate supply of artesian water giving a flow of 25,000 gallons an hour through the pool was obtained. Twice a week the pool was completely emptied and its walls were scrubbed with soap and stiff brushes and a thorough hose flushing followed the scrubbing. The bathers were under strict observation and an effort was made to bar all individuals with skin or any acute infection from the privileges of the pool. A shower bath was required and patrons were requested to empty the bladder before entering the pool. Expectoration and blowing of the nose were forbidden while in the water. Only the bathers were allowed on the floors surrounding the pool. With these changes an immediate cessation of this epidemic was recorded, and since that time I have not observed infections from this particular pool. Mr. Simons, in this instance, proved that sanitary control and proper efficient supervision of bathing pools are of vital public health significance.

It should also be borne in mind, as Rovinsky has stated, that ocean water, especially near the shore that contains outlets or discharge for sewers, contains a great many disease-producing organisms. In fact, at some shores one actually bathes in diluted sewage, and while the high tide may carry it away in the ocean, the low tide maintains it there with the flotsam and jetsam of the sea.

The American Public Health Association goes on record as stating that bathing places unless under strict sanitary control are in reality potential foci of infection, especially of the sinuses and ears.

The first comprehensive investigation of swimming pool sanitation was begun by a committee appointed for that purpose by the Public Health Association at its Chicago meeting in 1918. In their report the question was dealt with in a general way and the data contained therein was arrived at by questionnaires sent to each state and city board of health of the United States. The substance of the first reports showed that there were over 1245 pools in the United States, for the most part located in or near cities. Only two states, Florida and California, had specific statutes giving the state board of health direct charge and supervision over all swim-

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

ming pools and requiring operators to secure state board of health permits previous to operation. In six cities out of 281 specific ordinances covering supervision of pools were in effect.

Another report of this Committee was the result of 2000 questionnaires sent to ear, nose and throat specialists, dermatologists and health officers, and in brief 627 replies showed that 70 per cent of this number believed bathing places to be an important factor in the transmission of diseases.

The last report of the Committee on Bathing Places by the Sanitary Engineering Section of the American Public Health Association in Cleveland this year stated that all over the United States bathing place sanitation and control is receiving more study and consideration than at any time since the organization of this committee in 1918. In many states sanitary engineers were trying to instigate control regulations commensurate with current knowledge and practice. Notable among the states having regulations on this subject now are Arkansas, California, Florida, Idaho, Virginia, West Virginia and Tennessee.

The following abstracts are collected from this last report which would seem to be definite evidence that this subject is of vital interest to the otologist:

"Had an epidemic of otitis media and furunculosis of external canal here last June and July from public bathing places in our neighborhood." —Niagara Falls.

"This past summer I have had a series of cases of otitis externa (furunculosis) from different camps on different lakes. The large increase in cases this year leads me to feel that the water at these bathing places must have been the source of infection."—Waterville, Me.

"Frequently frontal sinus involvement will become epidemic, all cases coming from one swimming pool. We have had three or four of these epidemics in the past three years. As many as 40 or 50 cases from Y. M. C. A. pool at one time." —Tulsa, Okla.

"Have seen frequent epidemic infections of upper air tract among bathers in a given pool."—New York City.

"During August a daily average of ten to twenty cases in which a reliable history of pool bathing infections is given, mostly rhinitis, sinusitis, otitis, etc."—Baltimore, Md.

"In the summer of 1917 an epidemic of sinus and ear infections was reported by physicians in Jacksonville. These cases were reported as coming from one pool."—Jacksonville, Fla.

Aside from the literature published as the result of the American Public Health Association's activities there are numerous writings which deal with many phases of the subject. However, it is evident that the otologists have never carried out any organized investigation. The following abstracts are made after a review of the literature and are fairly representative of the more relevant articles:

McKenzie,[18] in a letter to the *Lancet*, states that every warm summer brings cases of ear suppuration following pool bathing, and the infection is quite frequently of a highly virulent type. In the summer of 1921, he had two cases of cerebellar abscess and later sinus thrombosis, both of which followed acute middle ear infection induced by pool bathing. The infection in these cases, he believes, reaches the middle ear through the eustachian tube. It is impossible to deny that pyogenic organisms are present in the water where people habitually bathe, and the water itself is most likely the source of infection.

Schmidt states that mycotic infection occurs most frequently after swimming. He concludes by saying that spores are carried into the ear while the swimmer is diving in infected water. The two varieties most frequently found are Penicillium and Aspergillus.

Forbes, in 1912, reported an interesting study of the types of organisms found in a London swimming pool. He found organisms indicating skin contamination such as Staphylococcus pyogenes aureus and members of the proteus group; organisms present in normal saliva, such as Streptococcus salivarius, etc., and organisms indicating fecal contamination, chiefly B. coli communis, B. pyocaneus and Streptococcus fecalis.

After delving into the literature one is impressed with the fact that the sports of swimming and diving in the ocean or in bathing pools are fraught with many perils. Have we as public servants given the matter of the education of the bather the attention it deserves? Certainly, if this subject were studied by a group of men considering the physics, physiology, path-

ology and the modus operandi of the invasions of these infections and the result of their work were put into the hands of the laity, a definite step forward toward preventive medicine would be taken.

The American Public Health Association is doing its part, but judging from the comparatively few replies to their questionnaires sent out to the ear, nose and throat men, it might seem they have not had the assistance from them which they deserve.

Means of preventing aural infection from swimming and diving may be divided into two classes, viz.: (1) supervision of bathing places by public health authorities; (2) education of the public as to the prophylactic measures which should be used by the bather in care of the nose and ears.

Under the first heading, the American Public Health Association has made so thorough a study of bathing sanitation that we shall not dwell upon it but merely refer to the reports of this body.

Under the second heading, we can again have the cooperation of the American Public Health Association. As evidence of this, in a communication to the author Mr. Simons, who is at present on the Committee on Regulation of Bathing Places of the American Public Health Association, says:

"It would be admirable if the Ear, Nose and Throat Section of this Society would designate a committee from their membership to work jointly with the Sanitary Engineering Committee of the American Public Health Association and thereby give greater and more careful study to many phases of the problem, such as (1) nature and extent of infections over the country, (2) epidemiologic studies, (3) suggestions as to proper standards to overcome present difficulties, and (4) some plan as to the proper education of the bather as to the care of the nose and ears while swimming or diving."

It is the opinion of the writer that this whole subject is of vital interest to the otologist as well as to the sanitary engineer. Cannot we, by the hearty cooperation of one group with the other, acquire ultimate success and lessen the frequency of these acute infections which run the whole gamut of pathological conditions from the innocent circumscribed furuncle to an involvement of the mastoid with all of its intra-cranial complications?

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DISCUSSION

Dr. W. T. Patton, New Orleans, La.—I am not absolutely sure in my mind that all this trouble is from infection. For instance, in the city of New Orleans one tank was known to be rather dirty, and the greater number of patients with ear troubles were found to have gone to this dirty tank. Recently the City Board of Health in its monthly bulletin published the number of germs found in a cubic centimeter of water taken from the various tanks and swimming beaches around the city, and you could almost follow a chart of the ear conditions by the prevalence of the germs in one place and another. But there was one tank that was scrubbed every night. Its water came from artesian wells, and there were practically no germs in it. Yet we had quite a few cases from that tank. I can speak personally there, because every time I went in that tank I had infection of the sinuses and usually the ears. Is it possible that the action of the water would cause irritation of the mucous membrane of the nose and following that go into the ear?

The public health officials should supervise the bathing pools, and if possible the bathing beaches in the vicinity. Certainly we could prevent bathing in the vicinity of sewer entrances. Second, we can caution our patients and try to start a campaign of education among the people about bathing. It is surprising how few people who go in swimming know anything about the injurious effects to ear, nose and throat. I had occasion recently to talk before one of the civic clubs and mentioned a number of precautions that could be taken in bathing, and the people were astonished that there was any danger in swimming.

Dr. Taylor did not go into the prevention of ear, nose and throat conditions from these tanks. But certainly if blowing the nose violently could be stopped, if ear plugs of some kind were used, and if people with ear and nose conditions were kept out of the water, it would be a beginning. I believe the normal nose gives very little trouble, but very few have normal noses. Perhaps the water irritates the mucous membrane and it swells, and in that way the eustachian tube is stopped up and we have trouble. Just why we get external otitis in these conditions I am not able to say. Why should we not have furunculosis of the whole body? I think it is probably due to the maceration of the delicate dermis by water, which breaks the skin and opens up an avenue of infection.

But I should like to see a committee appointed to look into this matter before next year and suggest to this Section something as a prevention.

Dr. E. H. Cary, Dallas, Tex.—This is an important subject, and one which the otologists treat rather carelessly. Even if nothing else is done except to bring the matter before the health officers who come here, it will be worth while.

Dr. John H. Foster, Houston, Tex.—The part we as otologists and rhinologists can play in this is educational. Health authorities are willing and anxious to do anything they can. They want the cooperation of the ear, nose and throat men in a campaign for the prevention of these troubles. The fact that much can be done in a preventive way is illustrated particularly in our own vicinity. We have to a certain extent educated the school children on the importance of preventing middle ear infections through bathing, giving simple instructions in regard to blowing the nose, etc., and I am confident that in the last two years the incidence of middle ear infection from bathing has decreased 50 per cent.

Dr. Arthur I. Weil, New Orleans, La.—One point was indicated by Dr. Patton in his discussion that I think should be brought out especially, in educating the public. That is that the normal mucous membrane does not seem to be susceptible to irritation and infection, as it is when there is chronic or subacute inflammation. The mothers should be taught that if their children have healthy noses the likelihood of infection is less. Frequently mothers bring their children in for some inflammatory condition and say, "My child has been bathing, and I want your advice as to whether it is advisable for him to continue." If the nose can be brought into a normal physiological state, if any pathology in the nose can be removed, it is perfectly safe to allow these children to bathe. Before they are allowed to go into bathing pools, which are all infected, if they are examined and the mucous membrane brought into a healthy condition, the children are safe.

Another point is the enormous number of furuncles, and especially diffuse external otitis, that go along with bathing. The reason for this I do not know. You can take infected water and syringe the ear, and if the ear is in normal condition you will not have a furuncle. But there is something that vitiates the integrity of the skin lining the external canal, consequently we have in many individuals who bathe in these pools, unless the ear is protected with cotton or wool, a diffuse external otitis following bathing.

Dr. Geo. E. Adkins, Jackson, Miss.—I question seriously whether pool water is responsible for furunculosis any more than sterile water could be. External otitis comes from constant moisture in the external canal. If you immerse your hand in water for thirty minutes (let it be pool water or sterile water) the skin will be wrinkled and degeneration of the epithelium will be the result. This same condition takes place in the external ear canal, the dead skin peeling off as the result of moisture and plugging up the canal, which sets up the irritation.

We very frequently have cases with a furunculosis who have been persistently irrigating the external canal. Our best remedy is to stop the irrigation, and give a prescription for borated alcohol. The external ear canal is lined with skin that is not subjected to many of the external forces and responds to an irritant more readily

than does the skin covering the balance of the body.

If you put wool plugs in the ear they act as syphons and take moisture in rather than prevent it. There are two remedies. One is stay out of the water, the other is to have the ear dried immediately after coming out of the water.

With reference to middle ear conditions and sinus conditions, I should like to add that the nose and accessory sinuses are not supposed to be irrigated or to come in contact with water, owing to the fact that they are lined with ciliated epithelium instead of pavement, which is supposed to stand water.

Dr. Benjamin F. Hodsdon, Miami, Fla.—Otitis media due to pool bathing is very frequent around Miami, Fla. I had a case of mastoiditis which I operated upon that was traced to pool bathing. Pool bathing when accompanied by diving is more serious than otherwise.

A young woman called at my office last week with earache. She was an expert swimmer. She had been bathing in a city pool. The consequence was otitis media.

Usually when a person has been in the water he will put a finger in the ear and shake it, thereby forcing the water against the ear drum, causing an abrasion and usually infection.

Dr. Joseph B. Farrior, Tampa, Fla.—The last word as concerns bathing pools has been said by Dr. Taylor. If we have a committee working to establish rules and regulations it will prevent this trouble in a small degree, if not a larger, and it will be worth all this time in discussion.

I am not prepared to say what produces this condition. My hope is that I shall be given some method of taking care of external ear infections. We find patients suffering from this condition more often than any other condition of the eye, ear, nose or throat. A man can argue many points as to the cause of internal conditions of the sinuses, antrum, etc., but very frequently they come from swimming pools.

I should like to have a treatment for external auditory canal infection.

Dr. C. L. Kibler, Columbia, S. C.—Within the last few years around Columbia there have been established a good many public bathing places by damming up branches, creeks, etc., which cannot be treated in a sanitary way like the Y. M. C. A. pools. As a result of these bathing resorts, I can conservatively state that the cases of furunculosis and acute otitis media have increased more than 100 per cent. A very great percentage of the cases are adults, traceable directly to bathing in the ponds. It is no longer a disease of childhood following the exanthemata. It is now no respecter of persons, as all ages frequent these bathing places.

The question is one of education and publicity. We as otologists know it. The public health service knows it, and has been combating it. And we want our patients and the laymen in general to realize the seriousness of the situation.

Dr. P. McG. Farrington, Memphis, Tenn.—I think Dr. Adkins is right in his remarks about the external otitis. We had some experience with a new pool this winter which was lined with tile, where a chemical filtration plant was in use. The water was repeatedly analyzed by the Board of Health and reported pure, but we still had a number of these cases. We induced the owners of the pool to leave out the chemical, believing it produced the irritation in the skin lining the canal. It was my belief that the chemically treated water, after drying in the canal, became concentrated enough to produce excoriation of the skin and that the infection was from the air and not from the water. The committee who had charge of the pool left off the chemical filtration, washed the pool twice a week, and we had a marked decrease in the number of cases reporting for treatment. In addition I suggested that every one, after coming out of the pool, should instill a saturated solution of boric acid into the ears and that they use plugs of no kind in the external canals while in the pool.

Dr. Taylor (closing).—The importance of the education of those who enjoy the sports of swimming and diving in preventing these infections cannot be emphasized too much.

A simple procedure, that is the protection of the ear from water by the use of cotton saturated in liquid petrolatum and the wearing of a tight-fitting bathing cap, will prevent such external ear affections as furunculosis and mycotic infections which are frequently secondary to pool bathing.

There is another phase of this subject which has not been developed and which is pertinent. That is the length of time one can remain in the water without reducing the body temperature and in this way lowering the resistance. Today children will spend an entire morning in an indoor swimming pool, or else play around it in their wet bathing suits, during which time they are not exposed to the sunshine. This chilling of the body lowers their resistance and makes them more susceptible to pathogenic organisms which may be present in the pool, or those which may be already harbored in the upper air passages. This is a different problem from that in the days of James Whitcomb Riley's "Old Swimmin' Hole," when we were clad in Nature's garb, and the body surfaces were kept warm and almost immediately dried in the sunshine.

RETROBULBAR NEURITIS OF MALARIAL ORIGIN*

By F. Phinizy Calhoun, M.D.,
Atlanta, Ga.

Ocular manifestations of constitutional diseases are common. Malaria, once a prevalent and widespread disease, but now less frequent and localized, has contributed its share to ocular complications. In 1879, Poncet mentioned that ocular lesions might be found in 10 per cent of all cases of true malaria. Such a high percentage could hardly be true today, when modern sanitation has robbed ophthalmology of many wonderful cases.

Of the various ocular complications which are attributed to malaria, optic neuritis is prominent, which classification has received the sanction of the Royal College of Surgeons.

A retrobulbar neuritis, or a malarial amblyopia, is less common, and I find recorded in the literature of the past twenty years only those cases mentioned by Fergus, Lauber, Agricola, Boutlard and Marquez.

The following cases are rather typical and all have been seen within one year:

Case I.—D. V. T., age 40, a salesman residing in the lower section of the State, complained of defective vision of two months' duration. His family history was negative for eye disorders. He was not addicted to the use of drugs, alcohol or tobacco. He had "indigestion" and had been told that he had malaria, but he was positive that he had not taken quinin.

The eye examination was: Vision right and left 20/70 unimproved; external appearance, normal; pupils, active; media, clear; and slight blurring of the nasal halves of the discs, while the temporal sides showed pigment crescents. In each macular region there were fine granular changes. The arteries were normal, but the veins were distinctly distended.

The visual fields at the first examination (2-11-20) showed an irregular contraction for form, and a rather marked contraction for colors. There was a central relative scotoma for colors in the right, and an absolute central scotoma for colors in the left eye. The right blind spot was slightly enlarged downward.

The nose and teeth were negative for infections by inspection and x-ray. The tonsils were imbedded and slightly infected. The urine was normal. Blood Wassermanns were negative. There were present many malarial parasites of the tertian type.

The patient's general appearance was bad. He had a waxy complexion commonly seen in the cachexia of this disease. A diagnosis of chronic retrobulbar neuritis of malarial origin was made, and five-grain capsules of the bisulphate of quinin were ordered four times a day.

Two months later vision had returned to 20/30 in each eye. The fields were full and there were no scotoma, and the general appearance and well-being of the man was better. Quinin was discontinued.

Case II.—J. G., age 19, a college student, living in Louisiana, complained of pain and blurred vision in the left eye of three days' duration. He gave a history of a similar attack in 1918, and according to the statement of his oculist the vision then was 20/15 in the right eye, left 5/180, and no definite conclusion was then reached as to the cause of this amblyopia. Several infected teeth were at that time removed, and finally the sight of the left eye improved under "tonic treatment." There was a history of a "black eye" in 1919.

Vision right 20/20 was corrected, left peripheral only. The right eye was normal. The left upper lid was slightly edematous and drooping. The external appearance of the eye was normal and the media clear. There was a marked pigment crescent at the temporal side of the dics, larger than the one in the right eye. The retinal vessels were normal.

The fields of the right eye were normal for form and color. The left field contained a small area above the fixation point which could detect large objects.

The nose, sinuses, and teeth were normal for infections. The tonsils had been cleanly removed. The sella turcica was of normal size and clear cut. The blood Wassermann was negative. The blood contained malarial parasites of the tertian type.

For a diagnosis two conditions were especially considered: first some retrobulbar nerve change resulting from the blow which this eye received some months previously. The large pigment temporal crescent was suggestive of an old hemorrhage into the optic sheath which according to Lagrange is strongly significant. Secondly, a retrobulbar neuritis of malarial origin was considered principally on account of the parasites found in the blood.

The latter opinion being the most likely, five grains of quinin bisulphate were ordered four times a day. One month later the sight had improved to 20/100 in the defective eye. At intervals he complained of periodic blurring in the right eye, but I could never demonstrate a scotoma or other changes. This could hardly have been due to the quinin since the left eye was steadily improving. Seven weeks after the initial examination, vision was 20/30. The fields had greatly improved, but there was an absolute central scotoma for colors. A subsequent examination showed normal vision, with no scotoma.

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*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

The next case, while not typical of retrobulbar neuritis, exhibited certain symptoms which, I believe, may be so classified.

Case III.—H. D. S. complained of acute pain in the right eye of six weeks duration, and in the

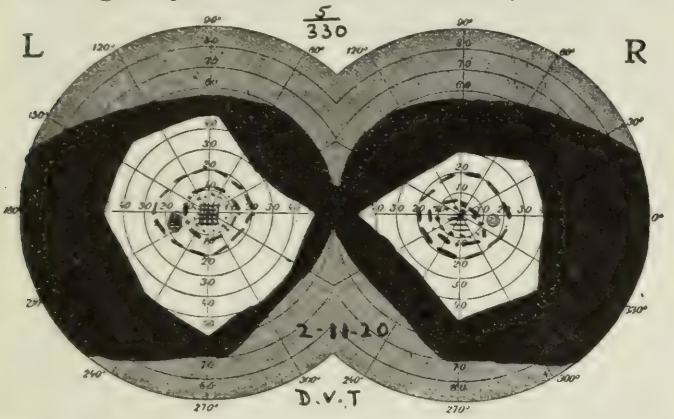

Fig. 1.—Case 1 contains a central relative scotoma in the right eye, and an absolute central scotoma in the left eye.

left eye of only one day. He described the pain as coming on at night and as deep seated in character, especially in motion of the eyes. There was a slight degree of photophobia. All of these symptoms were relieved by the instillation of a

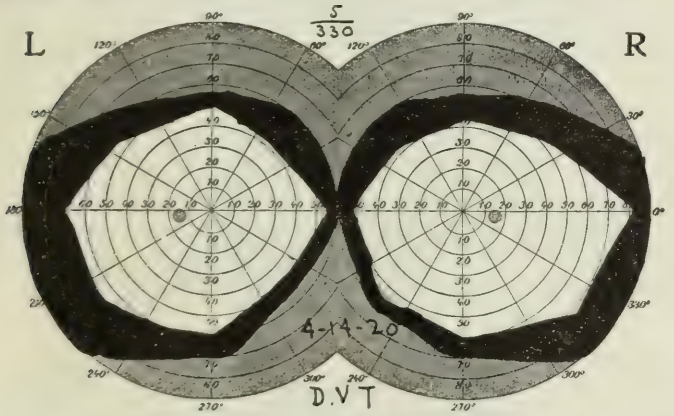

Fig. 2.—Case 1 after two months.

weak solution of cocain and homatropin, which he had been using at home for several days.

Vision was 20/20 in each eye. The external and internal structure were normal. Fields

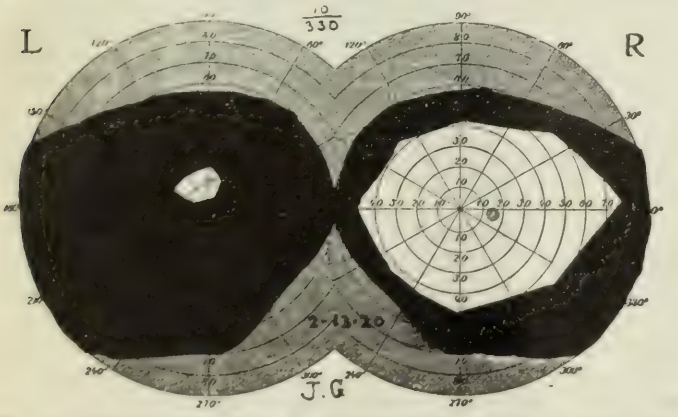

Fig. 3.—Illustrating Case 2, which shows only a small area of vision in the left eye.

were greatly contracted, and there was a relative blindness for red in the right eye, and an absolute blindness for red in the left eye.

Focal infections were negative in the teeth, tonsils, sinuses. The urine and blood Wassermanns were likewise normal, but the blood showed tertian malaria.

Here also all of the symptoms could readily be attributed to a malarial infection, and appropriate doses of quinin were ordered. In one week he was entirely relieved with restoration of the color defect. The acute ocular pain

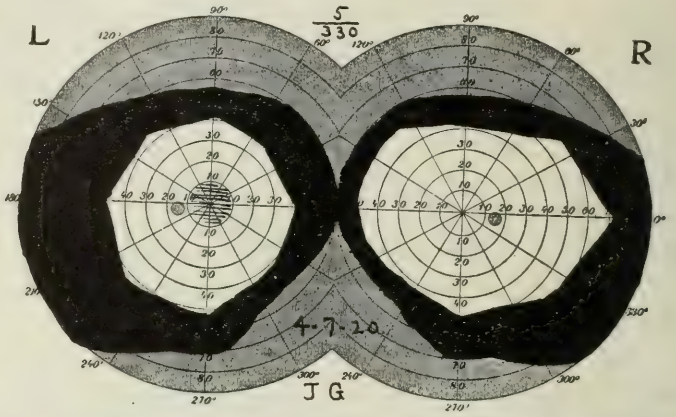

Fig. 4.—Case 2, after two months. The left eye contains a central relative scotoma which sequentially disappeared.

which was relieved by the instillation of cocain drops, was probably a toxic neuralgia affecting the corneal nerve terminals.

Of the cases reviewed Agricola's is the most typical. Following an attack of malaria in which the patient is supposed to have been cured, retrobulbar pain and defective vision developed simultaneously. The fundus was negative, and there were central absolute scotomata. Recovery was complete in two weeks.

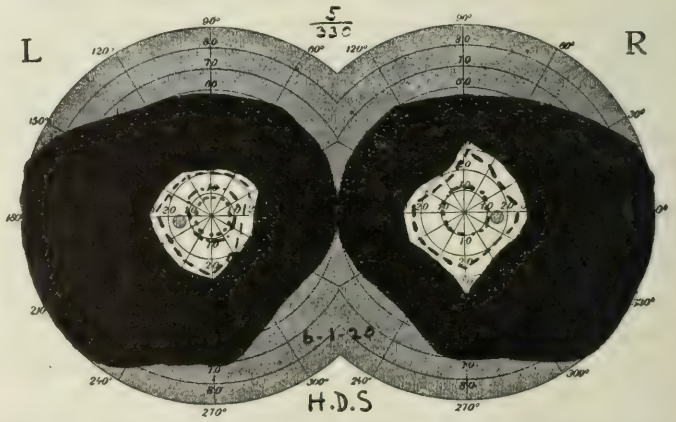

Fig. 5.—Illustrating Case 3, which exhibited marked peripheral contraction for form and colors.

Without doubt many of the nerve changes charged to malaria have really been due to massive doses of quinin, and careful questioning should be done in every case to elicit this information since most cases of malaria have been previously given quinin. A point of differentiation is the great congestion of the discs and distended retinal veins often found in malaria, as

compared to the pallor of the discs and contracted vessels seen in quinin poisoning.

The amblyopia, occasionally seen in malaria without visible fundus or field changes, and described by the patient as blurred or foggy vision, is probably a forerunner of the more definite clinical changes of a toxic retrobulbar neuritis with its accompanying scotoma. This was evident in Case 2, and Marquez mentions similar cases. De Schweinitz ascribes this amblyopia to a special action of the malarial parasite upon the nerve and retina.

Field changes, such as color scotoma and contractures for form and colors, are to be expected in malaria neuritis as were typically represented in all three cases, and substantiated by Fergus and Poncet. Likewise there is frequently a detention of the retinal veins, very suggestive in Case 1.

The fine granular macular changes described in Case 1, which I am not sure were pathological, might have accounted for the central field changes, but the other evidence was more conclusive that the nerve itself was involved. We can readily apply Poncet's explanation of these chorioretinal changes, which he states are quite frequent and due to "an embola of melancholic leucocytes in the capillaries," as also being the cause of these nerve affections.

Since the question of quinin amblyopia has been injected into this paper, it may not be amiss to mention briefly the therapeutic administration of quinin. No less an authority than Colonel R. H. Elliott, from his investigation and rich personal experience, gives valuable suggestions in a recent paper.

He emphasizes the importance of "first the salt of quinin employed; second, the vehicle in which the drug is given; third, the method of administration; fourth, the total amount of drug retained in the system; fifth, the individual idiosyncrasy of the patient; and sixth, the age, sex and weight of the patient."

It is most commonly agreed that the taking by mouth of not more than 45 grains in 24 hours of the sulphate or bisulphate of quinin is the safest way of administering the two most effective alkaloids. But after all it is the idiosyncracy of the patient which tells. The two most notable examples of which I know, are Elliott's report of a man, age 60, who suffered from amblyopia with contracted fields if he took 2 grains of quinin; and Finnoff's case of toxic symptoms of quinin poisoning following the instillation of a 1 per cent solution of ethylhydrocuperein into the conjunctival sac.

In attributing these cases of amblyopia to a retrobulbar neuritis of malarial origin, I was impressed by a statement made by Osler in his "Text Book." He said:

"The malarial poison is supposed to influence many affections in a remarkable way. The more closely such cases are investigated the less definite is the connection with malaria."

Taking heed of the warning of that great clinician every effort was made to find a cause in the study of these cases. A focus was established, measures adopted to eradicate it, and the eye condition improved. Such evidence appears conclusive.

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DISCUSSION

Dr. J. M. Hogshead, Chattanooga, Tenn.—About four years ago a child three years old from Dallas, Tex., was referred to me. The mother had lost two younger children and was anxious about this one. The child looked like a syphilitic, and we put her through the Wassermann test. The laboratory report showed that she was suffering from malaria. The fundus was much congested and the discs swollen, but of course at that age I was not able to get the measurement of its vision. I put her on quinin treatment and alternated it with sodium cacodylate, and the patient in three months was able to play like other children.

Another case was referred to me from Kingston. He had been in a lumber camp in Florida. The vision in his left eye was failing. He had been treated by several men for syphilis. Dr. Smith and I found he had malaria. At his suggestion I gave the patient sodium cacodylate, and with it some pituitrin. The reason I suggested pituitrin is that the optic nerve is partly within the eyeball and directly behind a part of the optic commissure. We obtained very gratifying results in this case.

I saw another case of a woman whose vision was 20/100. The laboratory test showed malaria, and her vision now is 20/30. She has a little connective tissue spot on the temporal side which will always be there.

Dr. E. W. Carpenter, Greenville, S. C.—The only case of ocular paralysis from malaria I have

ever observed was in a young girl of sixteen, apparently in perfect health, with a negative physical and laboratory examination, except that malaria plasmodia of the tertian type were found in the blood. I did not at that time attempt to prove whether the circular or radial fibres were involved. Apparently she had complete paralysis of accommodation. The vision was perfect in both eyes, the refraction practically normal, and with a plus three she could read the finest type at thirteen inches. In going into the case at first I was nonplussed, and procured my clue from a careful history-taking, which revealed the fact that two or three weeks previously the girl had had an irregular temperature. She lived in a country where malaria is practically unknown. Under quinin her accommodation was completely restored and for several years she had no recurrence.

Dr. G. C. Savage, Nashville, Tenn.—Quinin amblyopia is a very different thing from retro-bulbar neuritis. Quinin amblyopia is always double-sided. It always involves the field, but not the direct vision. Retro-bulbar neuritis involves only one eye as a rule. It is a very important condition, and fortunately rather rare. It is difficult to diagnose. During the years I have been observing, I have followed out this line of thinking: A patient comes in with very low vision in one eye; the other eye good. The fundus shows absolutely nothing wrong unless it be a slight paleness of the nerve head. The condition certainly is not such as would be found behind the commissure; for, if the disease producing the trouble were behind the commissure, both eyes would be involved. Naturally any collection of the inflammatory material within the sheath of the nerve manifests itself in pressure on the blood vessels, so if pressure does not show any change in the fundus of the eye, I say it is a case of retro-bulbar neuritis.

What is the cause? I think the inflammatory process is infiltration of the fatty connective tissue at or near the apex of the orbit. This effusion may be of a serious character, enough to make pressure on the sheath of the nerve, but the pressure being behind the entrance of the arteries does not manifest itself in the fundus of the eye.

I saw a case in consultation of a young married woman who was totally blind in one eye. The Doctor had given an unfavorable prognosis. I looked into her eye and found precisely what I have just told you. Because of this, I was inclined to think it was retro-bulbar neuritis and that she would recover. The fact is she did recover, and only last week her father told me her vision had remained perfectly good.

I also saw, recently, another case, a young lady who was practically blind in one eye without any impairment of vision in the other eye. The fundus showed no change except that the nerve head was a little pale. A diagnosis was made of retro-bulbar neuritis. She, too, has had a good recovery. I saw her a few weeks ago, and this past week her vision was reported to be 15/20. That woman improved much more rapidly after she began to spray her nose thoroughly with an oily spraying preparation. This leads me to believe that the condition of the posterior ethmoidal cells may cause an effusion into the connective tissue of the orbit toward its apex, and that may account for the blindness in retro-bulbar neuritis.

Dr. Calhoun (closing).—The cases just mentioned by Dr. Savage were certainly not of malarial origin, but were very likely a retro-bulbar neuritis or sinus disease. It is also my impression and experience that central field changes can occur as the result of quinin intoxication, and the only point of difference between a retro-bulbar neuritis of quinin or malarial origin, is the difference in the appearance of the disc and retinal vessels mentioned in the paper. It is important to have complete laboratory aid in the diagnosis of malaria; for artefacts and pigment changes in the blood will often deceive experienced laboratory technicians.

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SOME UNSOLVED PROBLEMS OF SYPHILIS

Regardless of our far-reaching knowledge of syphilis, there are still some unsolved problems, among which are the question of type or strain of the Treponema pallidum, the exact nature of the Wassermann reaction, the possibility of paternal transmission, and the reliability of our tests to determine a cure.

There are probably numerous types of the Treponema pallidum just as there are numerous types of micro-organisms, such as the pneumococcus, the streptococcus, etc. It has been demonstrated that more than one type of the treponema exists, but it has not been proven that the various types possess any selective characteristics.

Conjugal syphilis would seem to demonstrate the specificity of type and there are cases reported in which both husband and wife have developed lesions of the nervous system. However, there are numerous instances where this has not occurred. For example, there is an instance where lesions of the skin and bone predominated in the husband and nervous lesions in the wife. Another example is where the wife died with a heart lesion; the father developed a locomotor ataxia; and a son showed lesions mostly of the bony structures.

The exact nature of the Wassermann test is another unsolved problem. It was at first thought that this reaction was specific in that the antigen must contain the Treponema pallidum. However, this was found to be an error, for antigens known as artificial antigens soon came into general use, and because of their reliability, superseded the specific antigen. It was then discovered that practically all good antigens contained lipoids and it was thought that the changed relationship existing between lipoids and globulins produced the reaction. Cholesterin was later added to the antigen and it became more sensitive. The reaction is, therefore, not a true antigen-antibody reaction, for the injection of the antigen used into an organism would hardly produce a specific antibody.

Congenital syphilis and Colles' law or Baumes' law are still debated as is also Profeta's law; but the Wassermann reaction would seem to abrogate both. Paternal transmission is another unsettled point and it probably will be for some time to come, for the reason that study along this line requires years of observation and collection of data.

The most important of the unsolved problems relates to cure. Unfortunately, there are no standard requirements that a patient must meet before he or she is pronounced cured. Some physicians dismiss a patient as well without an examination of the spinal fluid, even though it has been shown that the fluid is infected, or the nervous system attacked, early in the disease. Great care should be exercised to ascertain definitely if any infection remains, not only by an examination of the blood but also by an examination of the

spinal fluid. Reliance should not be placed upon one Wassermann reaction alone, but the tests should be repeated over a long period of time.

COUE IN AMERICA

Many people unacquainted with the details of Mr. Coue's career in the United States have yet an unshakable conviction that he will carry home a supply of American money which does not need the difference between French and American exchange to give it great bulk, all of which goes to show the power of a slogan in advertising. Something of Mr. Coue's principle of healing is known now to nearly every unliterary and unscientific person. It is his slogan, not his results, which has made him known.

Coue has, as it were, filched the fundamental principle of Christian Science and the fundamental concept of the late psychologists. From the former he took the idea that faith can heal bodily ills; from the psychoanalysts the idea that there is a subconscious self which powerfully influences or controls the conscious. His actual method of healing borrows somewhat from the hypnotists.

Coue[1] says:

"I know that one generally passes for mad in the eyes of the world if one dares to put forward ideas which it is not accustomed to hear. Well, at the risk of being thought so, I say that if certain people are ill mentally and physically, it is that they *imagine* themselves to be ill mentally or physically."

This statement is not sufficient to make us consider him mad; for the Christian Scientists also say that we only think or imagine we are ill, and the Christian Scientists have a fairly large following.

Coue[1] further states:

"In order to understand properly the phenomena of suggestion . . . it is necessary to know that two absolutely distinct selves exist within us. Both are intelligent, but while one is conscious the other is unconscious. . . . The unconscious is responsible for the functioning of all our organs by the intermediary of the brain. . . . If it believes that a certain organ functions well or ill or that we feel such and such an impression, the organ in question does indeed function well or ill, or we do feel that impression.

"Not only does the unconscious self preside over the functions of our organism, but also over *all our actions whatever they are.*

. . . . . .

"The unconscious self is the grand director of all our functions. Make this believed . . . that a certain organ which does not function well must perform its function, and instantly the order is transmitted. The organ obeys with docility, and either at once or little by little performs its functions in a normal manner. This explains simply and clearly how by means of suggestion one can stop hemorrhages, cure constipation, cause fibrous tumors to disappear, cure paralysis, tubercular lesions, varicose ulcers, etc."

This is his hypothesis, that the conscious mind controls the body by means of the subconscious mind. Freud (by comparing Coue with whom we do the latter considerable honor) offered the hypothesis that the subconscious mind controlled the conscious, the bodily instincts being at the root of all. But Freud offers more proof for his hypothesis than does Coue.

Dr. Freud[2] laments that medical students are accustomed to steer away from psychology as something which asserts as facts things not demonstrable anatomically or clinically. They are prone to neglect psychology for this reason. He says:

". . . I am afraid your penalty will be this, that you will be forced to relinquish a portion of the therapeutic influence to which you aspire to those lay physicians, Nature-cure fakers and mystics whom you despise."

He thinks that the study of psychology, particularly of the unconscious impulses, is of value in medical diagnosis.

Physicians in general have too long neglected the mental symptoms of their patients, and the penalty they pay is that these mental conditions are exploited by persons ignorant of experimental science.

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1. Coue, Emile: "Self-Mastery Through Conscious Autosuggestion." New York: American Library Service, 1922.

2. Freud, Sigmund: "A General Introduction to Psychoanalysis." New York: Boni & Liveright, 1920.

It is not intended to suggest that Coue intentionally plagiarized from the psychoanalysts or the Christian Scientists. He is perhaps one of the Nature-cure fakers against whom Freud warns us.

He may be sincere in his faith in his own method, but his reports of cures demonstrate nothing except Coue's own ignorance. Persons are quoted as cured of tumors, tuberculosis, nephritis, etc., but no convincing evidence is advanced in the first place that the diseases or lesions were actually present—the obvious reason for the omission being that Coue himself knows little or nothing of the symptoms, signs or pathology of disease.

Undoubtedly in cases where the individual only thinks himself ill, Coue's method will be of great benefit, since the mind acts upon the body and vice versa. Excitement can cause indigestion, indigestion pessimism, etc.; and if one tells certain persons that they are looking better, they feel three times as strong.

The suggestion that the subconscious is the link connecting the conscious and the bodily functions might be used as an hypothesis in therapeusis. Coue has certainly not proved it. The diagnosis of any illness which causes symptoms painful or objectionable to the patient should be made by a man who is competent to recognize conditions needing medical or surgical attention, not by a pharmacist such as Coue, or by the laity, or by the patient himself.

HOME FOR INCAPACITATED PHYSICIANS

Certain fraternal organizations and some of the crafts have established from time to time homes for the care of their aged, or otherwise incapacitated, members. That these homes are filling a need is evidenced by the large number of their inmates.

The idea that some similar institution be founded for Southern physicians was suggested by Dr. Paul J. Gelpi, of New Orleans, President of the Louisiana State Medical Association, in his inaugural address in April, 1922. Later, he presented the plan to the Southern Medical Association at the Chattanooga meeting in November, 1922, where the idea received further endorsement.

No more pathetic sight is met with than that of a superannuated, helpless, penniless physician, tottering on the down grade of life after having spent his active years in hard work but with nothing available for his support during the autumn of life. True, and fortunately so, there are not many of these; but most communities can show at least one or two, so that the total number in a state or in the whole South would doubtless be surprisingly large.

Opponents of such an institution argue that old people do not long survive transplantation to new environments, that they yearn for old acquaintances and familiar scenes and thus pine away and die. Often an old man has a wife whom he does not wish to leave. It is further maintained that such an unfortunate may possess a relative or friend who could care for him if only a small sum of money were available, frequently less than the pro rata maintenance cost at an institution.

Dr. Gelpi does not insist upon institutionalizing all who are in need of help. However, he thinks some kind of provision should be made for them. The desirability of a separate building, its location, the means of raising the funds, those eligible for help, and the question of dues which would later grant the privileges of the home, are details yet to be worked out. The report of the special committee of the House of Delegates of the Louisiana State Medical Association next April may deal

with some of these points. At least it will be awaited with interest.

Meanwhile, valuable data can be compiled if each reader of the JOURNAL will write giving the number of needy physicians living in his community, anywhere within our territory. In order that there may be no duplications, it is suggested that this information include as a minimum: the individual's initials, age, town, and the general nature of the incapacity.

The JOURNAL does not know how practical this somewhat socialistic project may prove to be, but at least it is important enough to justify our careful consideration.

The development of this plan in Louisiana will be followed by the rest of the South with interest.

Book Reviews

Brain Abscess. Its Surgical Pathology and Operative Technic. By Wells P. Eagleton, M.D., Newark, N. J., Lt.-Colonel, M.R.C.; President, American Otological Society, 1921; Medical Director, Newark Eye and Ear Infirmary, Newark, N. J.; Chief of the Division of Head Surgery, Newark City Hospital; Attending Craniologist, Newark Presbyterian Hospital; Consulting Craniologist, St. Barnabas Hospital and St. Michael's Hospital, Newark, N. J., and Muhlenberg Hospital, Plainfield, N. J., and Mountainside Hospital, Montclair, N. J.; Chief of the Section of Surgery of Head, Base Hospital, Camp Dix, N. J., 1917-1918. New York: The Macmillan Company, 1922.

In this monograph the writer has attempted to correlate the surgical treatment of the different pathological lesions of brain abscess, for he believes that, although pathology and treatment usually are dealt with in separate chapters, they are in reality one and should be so considered. Certain it is that if one is to meet with even a moderate degree of success in the treatment of brain abscess, the surgical manipulation in each individual case must be adapted to the exact pathological condition present.

How far he has succeeded, each individual reader must judge for himself. There can be no question, however, of the painstaking thoroughness of this effort.

In the chapter on diagnosis the writer voices many opinions which must be regarded as purely speculative, much of which doubtless will be demonstrated to be fallacious as our physico-pathological understanding of the clinical manifestations of suppurative cerebral lesions increases.

Nor does he apologize for the minutely detailed technic. He has emphasized the technic, because he has learned from personal experience to regard it as equally important with diagnosis. While the opinions expressed are his own, he has endeavored, whenever possible, to substantiate them by reference to recorded opinions and observations. When an unsubstantiated opinion is cited, the authority for it is given in the text.

It is by far the best and most comprehensive monograph dealing with intracranial suppuration that the year has brought forth.

Surgically considered, intracerebral abscess stands in a class by itself, the problems presented in its surgical treatment differing from those of suppuration in other parts of the body and are distinct from those encountered in the treatment of non-suppurative lesions of the brain.

Minor Surgery, Including Bandaging. By Henry R. Wharton, M. D., Consulting Surgeon to the Presbyterian Hospital, Children's Hospital, St. Christopher's Hospital, The Bryn Mawr Hospital and Girard College; Fellow of the American Surgical Association. Ninth Edition. Thoroughly Revised with 450 illustrations and 647 pages. Philadelphia and New York: Lea & Febiger, 1922. Cloth, $4.00.

This popular volume is undergoing its ninth edition. It contains no descriptions of major operative procedures, but has the simpler methods of blood transfusion and the Carrel-Dakin method of wound treatment among other minor procedures. Profuse illustrations of the generally employed methods of bandaging make it a clear and very useful book.

A Manual of Gynecology. By John Osborn Polak, M.Sc., M.D., F.A.C.S., Professor of Obstetrics and Gynecology, Long Island College Hospital; Professor of Obstetrics, Dartmouth Medical School; Gynecologist, Jewish Hospital; Consulting Gynecologist, Bushwick, Coney Island, Deaconess', and Williamsburg Hospitals, Brooklyn, and the People's Hospital, New York; Fellow American Gynecological Society, New York Academy of Medicine, etc. Second edition, thoroughly revised. Illustrated with 139 engravings and 10 colored plates, and containing 396 pages. Philadelphia and New York: Lea & Febiger, 1922. Cloth, $4.50.

The chapters on menstruation, ectopic pregnancy, pelvic inflammation, and sterility have been rewritten to conform to the advances of the last ten years in gynecology. The illustrations in the book are full and valuable.

Manual of Diseases of the Nose and Throat. By Cornelius G. Coakley, A.M., M.D., F.A.C.S., Professor of Laryngology and Otology, College of Physicians and Surgeons, Columbia University; Attending Surgeon, Bellevue Hospital, in charge Laryngological and Otological service; Consulting Laryngologist and Otologist, Presbyterian Hospital; Fellow of the New York Academy of Medicine; Fellow of the American Laryngological Association. Sixth Edition, Revised and Enlarged. New York and Philadelphia: Lea & Febiger, 1922. Cloth, $4.25.

The sixth edition of Coakley's Manual with the additional illustrations and the new chapter on diseases of the nasal vestibule, the special articles on sinusitis in children, Vincent's angina, parapharyngeal abscess and the direct examination of the upper air and food passages, will prove a valuable reference book for students and general practitioners.

Ophthalmoscopy, Retinoscopy and Refraction. By W. A. Fisher, M.D., F.A.C.S., Chicago, Ill., Professor of Ophthalmology, Chicago Eye, Ear, Nose and Throat College; Late Professor of Clinical Ophthalmology, University of Illinois; Late Surgeon, Illinois Charitable Eye and Ear Infirmary; Late President, Chicago Ophthalmological Society. With 248 illustrations, including 48 colored plates. Published by W. A. Fisher, 31 North State street, Chicago, Ill.

The carefully compiled information in tabloid form renders this a valuable little compend for the general practitioner who dabbles in refraction; but presents nothing new to the qualified ophthalmologist.

Bronchoscopy and Esophagoscopy. A manual of Peroral Endoscopy and Laryngeal Surgery, by Chevalier Jackson, M.D., F.A.C.S., Professor of Laryngology, Jefferson Medical College, Philadelphia; Professor of Bronchoscopy and Esophagoscopy, Graduate School of Medicine, University of Pennsylvania; Member of the American Laryngological Association; Member of the Laryngological, Rhinological and Otological Society; Member of the American Academy of Ophthalmology and Oto-Laryngology; Member of the American Bronchoscopic Society; Member of the American Philosophical Society, etc. With 114 illustrations and 4 colored plates. Philadelphia and London: W. B. Saunders Co., 1922. Cloth, $5.50.

This book is based upon an abstract of the author's larger work, "Peroral Endoscopy and Laryngeal Surgery." The abstract was prepared under the author's direction by a reader, in order to get a reader's point of view on the presentation of the subject in the earlier book. With this abstract as a starting point, Dr. Jackson has endeavored to accomplish the difficult task of presenting by written word the various purely manual endoscopic procedures. The large number of corrections and revisions found necessary has confirmed the wisdom of the plan of getting the reader's point of view; and these revisions, together with numerous additions, have brought the treatment of the subject up to date so far as is possible within the limits of a working manual.

An Outline of the Medical Service of the Theatre of Operations. By M. A. W. Shockley, Lieutenant-Colonel, Medical Corps, U. S. Army. 8 diagrams and 230 pages. Philadelphia: P. Blakiston's Son & Co., 1922.

This book has been rewritten from lectures and conferences given at the General Service School with the idea that it might be of service to both line and medical officers. Although technical in character it is clearly and pleasingly written and should be of value to the Reserve and National Guard officer as well as to the officers of the Permanent Establishment of the U. S. Army.

Diseases of the Heart. A Handbook for Students and Practitioners. By I. Harris, M. D., L.R.C.P. (Ed.); Honorary Physician-in-Charge, Cardiographic Department, Liverpool Northern Hospital. 50 text figures. 196 pages. New York: William Wood & Co., 1922. Cloth, $3.00.

This book is written very uncompromisingly. The author at times stresses his views when they are not in accord with the accepted teachings of modern cardiology. Furthermore, he does not give the data from which he draws his deductions. Despite the fact that in places there is sound teaching, this can be found in so many other manuals, that one is at a loss to know why this book was written.

Lessons in Pathological Histology. By Gustave Roussy, Professeur Agrege, Chef des Travaux Pratiques d'Anatomie Pathologique a la Faculte de Paris, and Ivan Bertrand, Chef de Laboratorie Delegue a la Clinique des Maladies Nerveuses de la Faculte de Paris. Translated from the Second French Edition by Joseph McFarland, Professor of Pathology and Bacteriology in the Medical Department of the University of Pennsylvania. Philadelphia: Lea & Febiger, 1922.

This little work is novel in plan and execution. In a series of 124 plates it presents excellent drawings made from actual sections of pathological tissues. The text on the page opposite each drawing directs attention to significant features of the lesion, emphasizes the deductions to be drawn from them and lays down the final diagnosis. Thus far, the book is interesting and entertaining. But, unfortunately, the execution of the plan is not so happy as its conception. The lesions selected for illustration are not well chosen and there is little or no orderliness in their arrangement. More disturbing than this is the fact that, at least for the American student, the terminology is different from that of his usual texts. For example, the term "epithelioma" is applied indiscriminately to carcinomata of squamous cell and of glandular type. The treatment of the white blood cells is inadequate and confusing. There are occasional inaccuracies or misprints, such as that giving the diameter of the erythrocytes as 7 to 8 mm. The statement that in fatty liver "the hepatic tissue is gradually replaced by adipose tissue not unlike that under the skin" is, to say the least, misleading. Nor will the American student obtain any very clear idea from the observation that in a "seminoma" some tumor cells "recall the appearance of lymphocytes and seem to be of inflammatory nature and more or less conjunctivo-vascular."

Despite such shortcomings, the book constitutes an interesting attempt to transfer into the field of pathologic histology something of the idea represented by the case-history type of book that has found such favor in the clinical branches.

The Art of Anaesthesia. By Paluel J. Flagg, M.D., Lecturer in Anaesthesia, College of Physicians and Surgeons, New York; Consulting Anaesthetist, Bellevue Hospital, Jamaica Hospital, St. Joseph's Hospital, Yonkers; Visiting Anaesthetist, St. Vincent's Hospital, New York; Formerly Lecturer and Demonstrator in Anaesthesis, Rockefeller Institute War Demonstration Hospital; Visiting Anaesthetist to Roosevelt Hospital, the Woman's Hospital and Fordham Hospital, New York City. Third Edition Revised, with 136 illustrations and 371 pages. Philadelphia and London: J. B. Lippincott Co., 1922. Cloth, $4.50.

The art of anesthesia has become very complicated in the brief time since the discovery of ether anesthesia by Crawford Long a little over a half century ago. The rapidly improving methods call for frequent revisions of extant works upon the subject, as is shown by the shortness of the periods which have elapsed between the three editions of this book. Its author feels now that the wide use of nitrous oxid-oxygen anesthesia, still very popular in many places, has passed its peak, and that for good reasons there is a distinct reversion to ether.

Recent instruments for accurate determination of the anesthetized patient's condition are discussed. The work is up-to-date and of unusual value.

Your Inner Self. By Louis E. Bisch, A.B., M.D., Ph.D. 193 pages. Garden City: Doubleday, Page & Co., 1922. Cloth, $1.50.

An attempt to give the elementary principles of psychoanalysis for those who are not acquainted with the subject. Popular Science.

Protists and Disease. Vegetable Protists; Algae and Fungi, including Chytridineae; Various Plassomyxineae, the Causes of Moluscum Contagiosum, Smallpox, Syphilis, Cancer and Hydrophobia; Together with the Mycetozoa and allied groups. Being the Sixth Book published for the Author on the same subject. By J. Jackson Clarke, M.B. (Lond.), F.R.C.S., Senior Surgeon Hampstead and Northwest London Hospital, and Surgeon Royal National Orthopedic Hospital. Illustrated with a frontispiece and 61 Text Figures. 229 pages. New York: William Wood & Co., 1922. Cloth, $5.00

This volume is one of a series of books on the same subject and the author takes the stand that the generally accepted teachings of biology and botany are incorrect in so far as the conception of the cell is concerned. He considers the causes of syphilis, cancer, smallpox, hydrophobia, moluscum contagiosum are a vegetable parasite of the synchritrium family. This is deduced from imperfect data.

Besides the fact that the author's conclusions are not substantiated by the data submitted, the book is written in such a poor style that it is difficult to keep one's interest focused upon the subject.

Food and the Principles of Dietetics. By Robert Hutchison, M D., F.R.C.P., Physician to London Hospital and the Hospital for Sick Children. Fifth edition, 610 pages. William Wood & Co., 1922. Cloth, $5.00.

At no time in the history of medicine has such interest been manifested in the subject of foods and diet as is evident today. Many advances have been made in the study of food and food relation to disease as well as to health. Consequently a large number of new books and revisions of old books have appeared recently, discussing the foods and diet in light of modern investigations. This book is but another example of this type. The new fifth edition of this English work follows the general plan of former editions.

Many interesting features are noticed, among which is a discussion of the problems of diet and nutrition presenting modern views, and also a discussion of different biological values of different foods. The subjects usually discussed in such a work are chapters on animal foods, milk and milk products, vegetables, cereals, bread, and in fact every kind of food stuff or products, vitamins, etc. The question of cooking food and the digestion of foods are given due consideration. The principles of feeding in infancy, and childhood, and also feeding in the various diseases are presented in a satisfactory manner. However, one cannot help noticing the incompleteness of references to diet in diabetes.

The work as a whole is good, and conforms to the usual type of books we receive from English writers.

The Medical Clinics of North America. Published Bi-Monthly. Volume 6, No. 1, July, 1922. St. Louis Number. Illustrated with 61 text figures. 203 pages. Volume 6, No. 2, September, 1922. San Francisco Number. Illustrated with 46 text figures. 204 pages. Volume 6, No. 3, November, 1922. New York Number. Illustrated with 27 text figures. 364 pages. Philadelphia and London: W. B. Saunders Co., 1922. Paper, per year, $12.00.

"The Medical Clinics of North America" is a standard publication which is of real practical use to a large number of physicians. In the three volumes that are here reviewed, certain articles stand out both by their clarity of presentation and their practical application. The clinic by Dr. H. E. B. Pardee on "Management of Patients with Heart Disease During Pregnancy and Labor," should be read by every one engaged in obstetrical work. Dr. Herman O. Mosenthal's paper on "Maintenance by Diet in the Treatment of Diabetes Mellitus" is of much practical value. The clinic of Dr. Ernst P. Boas on "Diseases of the Aorta and Aortic Valves" is also worthy of mention.

In the St. Louis Number, the clinic of Dr. W. M Kim Marriott on "Chronic Digestive Insufficiency (Celliac Disease)" and Dr. Ralph A. Kinsell's clinic on "A Bacteriological Clinic Diagnostic Method" are of most practical value.

In the San Francisco Number, the clinic of Drs. Alfred C. Reed and Harry Wyckoff on "Interstitial Protozoa in Clinical Practice" and the clinic of Drs. Charles Fleischner and Edward B. Shaw on "The Management of Diphtheria" are of most importance.

Various other worthy papers are not discussed purely from lack of space.

Physical Exercises for Invalids and Convalescents. By Edward H. Ochsner, B.S., M.D., F.A.C.S., President, Illinois State Charities Commission; Attending Surgeon, Augustana Hospital, Chicago. Second edition, with 56 pages. St. Louis: C. V. Mosby Co., 1922. Cloth, $0.75.

Dr. Ochsner describes forty exercises, simply and with illustrations. It is valuable to the orthopedist, the surgeon, the general practitioner, to the convalescent and even to the business man who leads a sedentary life. However, the special use of each exercise is not indicated.

Regional Anesthesia: Its Technic and Clinical Application. By Gaston Labat, M.D., Lecturer on Regional Anesthesia, New York University; Laureate, Faculty of Medicine, University of Paris; Formerly Special Lecturer on Regional Anesthesia, Mayo Foundation, University of Minn. With a Foreword by William J. Mayo, M.D. 315 original illustrations and 496 pages. Philadelphia and London: W. B. Saunders Co., 1922. Cloth, $7.00.

A fad to be used on appropriate and inappropriate occasions by some surgeons, avoided in all possible cases by others, regional anesthesia is still gaining in popularity. It undoubtedly will be found to have a far greater utility than it now has in the eyes of the average practitioner.

This author, who was aided in his compilation by various artists and other persons attached to the Mayo Clinic, explains the technic of the administration of regional anesthesia in all parts of the body. The solutions to be used, the instructions to be given the nurses, general method, blockings of various nerves, methods in operations upon different parts of the body, with special attention to operations upon the eye, ear, nose, throat, teeth and genito-urinary organs, are described.

The volume is a very important contribution to an increasingly important subject.

Southern Medical News

ALABAMA

Madison County Medical Society has elected the following officers: Dr. Carl A. Grote, President; Dr. T. E. Dryer, Vice-President; Dr. James B. Loughlin, Secretary-Treasurer.

Dr. C. A. Grote has been elected President of the Huntsville Kiwanis Club.

Mobile County Medical Society has elected the following officers: Dr. George C. Kilpatrick, President; Dr. William W. Perdue, Vice-President; Dr. Willis W. Scales, Secretary; Dr. Edly W. Cawthorn, Treasurer.

Morgan County Medical Society has elected Dr. John C. Bragg, Albany, President; Dr. O. M. Roan, Vice-President; Dr. B. F. Austin, Secretary-Treasurer.

Randolph County Medical Society has elected the following officers: Dr. Charles E. Ford, President; Dr. William W. Stevenson, Secretary-Treasurer.

Shelby County Medical Society has elected the following officers: Dr. Claudius O. Lawrence, President; Dr. Willena Peck, Secretary-Treasurer.

Dr. J. F. Yarbrough's Private Sanatorium, Columbia, was totally destroyed by fire November 16. The patients were all saved. The loss was $41,800.

Dr. C. A. Grote, City and County Health Officer for Madison County, has resigned to accept the position of County Health Officer for Guilford County, North Carolina, with offices in Greensboro. Dr. F. B. Austin, Health Officer of Morgan County, has succeeded Dr. Grote.

All the occupants of the Huntsville poor house have been transferred to the new Madison County Home, Fegin Spring Cove, near Huntsville, which was recently opened.

As a memorial to General Wm. C. Gorgas, a drinking fountain presented by the local chapter of the Daughters of the American Revolution to the Gorgas Public School was unveiled November 24 at Toulminville.

Northern Alabama counties are planning to establish health units, according to Dr. W. K. Sharp, of the United States Public Health Service. Limestone County has recently provided an annual appropriation of $5,000 for the establishment of a health unit to be directed by an all-time health officer.

The two new wards for the Bryce Hospital, Tuscaloosa, are under construction. The new addition will represent an expenditure of $150,000.

Deaths

Dr. Thomas Pack Vann, Eva, aged 48, was killed December 8 when the car in which he was driving was wrecked.

Dr. Andrew Joseph Edwards, Woodward, aged 35, died October 15 from influenza.

ARKANSAS

Green County Medical Society has elected the following officers: Dr. E. S. Baker, President; Dr. D. L. Boyd, First Vice-President; Dr. J. G. McKenzie, Second Vice-President; Dr. F. M. Scott, Secretary-Treasurer.

Pulaski County Medical Society has elected the following officers: Dr. D. A. Rhinehart, President; Dr. H. A. Higgins, Vice-President; Dr. R. J. Calcote, Secretary; Dr. W. R. Bathurst, Treasurer.

Sebastian County Medical Society has elected the following officers: Dr. W. R. Rose, Fort Smith, President; Dr. W. G. Eberle, Fort Smith, Vice-President; Dr. H. H. Smith, Fort Smith, Treasurer; Dr. J. D. Southard, Fort Smith, Secretary.

The corner-stone of the St. Edward's Infirmary, Fort Smith, has been laid. It will be a four-story building with accommodations for 150 patients and will be erected at a cost of $200,000. The Sisters of Mercy of Fort Smith will be in charge.

Dr. Leonidas Kirby, Harrison, was elected President of the State Board of Health.

The second floor of the Foreman Block, Texarkana, has been leased by the Federal Government for the use of a general clinic for ex-service men. The rooms were remodeled at a cost of $5,000. The clinic was opened January 1 with a full staff of physicians, dentists, pharmacists and nurses.

Deaths

Dr. Henry Hodgen Kirby, Little Rock, aged 39, died suddenly near Lonoke December 9 while hunting.

Dr. James M. Johns, Texarkana, aged 73, died November 21.

DISTRICT OF COLUMBIA

The Medical Society of the District of Columbia has elected the following officers: Dr. Luther H. Reichelderfer, President; Dr. J. Russell Verbrycke, Jr., First Vice-President; Dr. Edith SeVille Coale, Second Vice-President; Dr. Coursen B. Conklin, Recording Secretary; Dr. Prentiss Willson, Corresponding Secretary; Dr. E. G. Seibert, Treasurer.

The United States Veterans' Bureau offers a special course in neuro-psychiatry to a certain number of qualified physicians on condition that upon completion of the course they will continue in the service of the bureau for a period of at least two years. The main part of the course will be given at St. Elizabeth's Hospital, Washington.

The budget for the fiscal year 1924, submitted to Congress by the President, provides $217,385 for the health department of the District of Columbia. The appropriations recommended include $40,000 for prevention of contagious diseases in the District; $6,500 for maintenance of disinfecting service; $2,000 for enforcement of the act providing for drainage of vacant lots; $1,000 for maintenance of a chemical laboratory; $8,000 for dairy farm inspection.

Beginning February 27, a second course in physiotherapy will be given at the Walter Reed General Hospital, Washington, and will continue for a period of four months. It is open to women who have had at least two years of training in an approved school of physical education.

Dr. Gleaves B. Kenny, Lieutenant, M.C., U. S. Army, Washington, and Miss Pearl Lee Braswell, Norfolk, Va., were married November 30.

Deaths

Dr. Edmund Thomas Murdaugh Franklin, Washington, aged 38, died recently.

Dr. John Potts Fillerbrown, Washington, aged 64, died November 24, following a long illness.

Dr. Meade Randolph Edmunds, Washington, aged 40, died November 30 at the Emergency Hospital from accidental asphyxiation.

Dr. Daniel Olin Leech, Washington, aged 60, died December 14, following an operation.

FLORIDA

Dr. G. H. Benton announces the opening of the Sterling-Worth Sanitarium and Psychopathic Hospital, Coconut Grove, Fla. Practice confined to nervous and mental diseases.

On November 17, under the auspices of the American Society for the Control of Cancer, Dr. Gaetano Bottaro, Genoa, Italy, delivered a lecture on "Prophylaxis and Cure of Cancer" at Tampa. This was the first of a series of lectures on

cancer that will be given at the Latin clubs in the native languages.

An antimosquito conference was held in Daytona December 7-8 in an effort to organize a state association for eradicating the mosquito. There were delegates representing twenty-one cities and towns in the State, four railroads, the Florida Development Board, the U. S. Department of Agriculture, the U. S. Public Health Service, the State Board of Health, and various State and women's organizations.

The State Board of Health has started a mosquito survey of St. Augustine.

The quarantine station headquarters has been moved from Mullet Key to Tampa.

Deaths

Dr. Reuben B. Garnett, St. Augustine, aged 84, died November 23.

Dr. Columbus Drew, Jacksonville, aged 76, died December 13.

GEORGIA

Chatham County Medical Society has elected the following officers: Dr. Herman W. Hesse, President; Dr. Edward C. Demmond, Secretary.

Floyd County Medical Society has elected the following officers: Dr. J. L. Garrard, President; Dr. W. B. Floyd, Vice-President; Dr. M. M. McCord, Secretary.

Chattooga County Medical Society has elected the following officers: Dr. B. F. Shamblin, Lyerly, President; Dr. J. W. Clements, Dirttown, Vice-President; Dr. F. W. Hall, Summerville, Secretary-Treasurer.

Dr. Harry B. Neagle, Augusta, has been appointed Health Officer of Augusta and Richmond County.

The new Wesley Memorial Hospital, erected on the campus of Emory University, Atlanta, by the Southern Methodists, was formally opened December 1. It is a six-story building and has a 200-bed capacity. The Lucy Elizabeth Candler Memorial Hospital is connected with the main building and has sixty-five beds. Mr. Walker White, former Treasurer of the University, is Superintendent and Secretary.

Dr. Eugene E. Murphy, Augusta, has been re-elected President of the City Board of Health.

Deaths

Dr. John H. Hockenhull, Cumming, aged 59, died November 19.

Dr. Robert Lee DeLoach, Decatur, aged 53, died December 24.

Dr. Walter B. Mott, Mount Mourne, aged 87, died October 23 from senility.

Dr. Patrick Clabon Nunn, Davisboro, aged 60, died December 14 from acute indigestion.

KENTUCKY

The Kentucky Conference of Social Work has re-elected Dr. A. T. McCormack President.

The Louisville Urological Society has elected the following officers: Dr. Henry J. Farbach, President; Dr. E. Owsley Grant, Vice-President; Dr. Herman B. Strull, Secretary-Treasurer.

Clark County Medical Society has elected the following officers: Dr. J. E. Baucom, President; Dr. S. J. Rose, Vice-President; Dr. E. R. Cole, Secretary-Treasurer.

Daviess County Medical Society has elected the following officers: Dr. A. L. Kincheloe, Stanley, President; Dr. H. K. Orsburn, Vice-President; Dr. J. J. Rodman, Secretary-Treasurer.

Henderson County Medical Society has elected the following officers: Dr. G. W. White, President; Dr. C. L. Nollau, Vice-President; Dr. P. Ligon, re-elected Secretary.

Lincoln County Medical Society has elected the following officers: Dr. J. A. Harmon, Crab Orchard, President; Dr. J. E. Peyton, Stanford, Vice-President; Dr. Lewis J. Jones, Stanford, Secretary-Treasurer.

Madison County Medical Society has elected the following officers: Dr. C. E. Smott, President; Dr. R. A. Phelps, Union City, Vice-President; Dr. J. A. Mahaffey, re-elected Secretary-Treasurer.

Montgomery County Medical Society has elected the following officers: Dr. John F. Knox, President; Dr. P. K. McKenna, Vice-President; Dr. D. H. Bush, Secretary-Treasurer.

McCracken County Medical Society has elected the following officers: Dr. F. A. Jones, President; Dr. Virgil L. Powell, Vice-President; Dr. H. P. Linn, Secretary; Dr. P. H. Stewart, Treasurer.

Perry County Medical Society has elected the following officers: Dr. S. B. Snyder, President; Dr. M. E. Combs, Vice-President; Dr. J. P. Boggs, Secretary.

Russell County Medical Society has elected the following officers: Dr. W. G. D. Flanagan, President; Dr. A. V. Neathery, Vice-President; Dr. J. B. Schol, Secretary-Treasurer.

In order that more work of a preventive measure may be made possible, especially in the fields of normal mental health, mental disease, feeble-mindedness, dependency and delinquency, the State Board of Health has created a new department to be known as the Bureau of Mental Hygiene.

The following have been appointed on the medical advisory staff for the Institute for the Feeble-Minded: Dr. L. T. Minish, President; Drs. E. C. Roemele, G. H. Heilman, C. F. Coleman, John Patterson and J. S. Coleman.

Miss Lawrence is now in charge of the Ashland General Hospital, the Sisters of St. Francis having left the institution to take charge of a new hospital in Toledo, Ohio.

Dr. Herbert T. Thornburgh, Toledo, Ohio, has been appointed Assistant Superintendent of the Eastern State Hospital, Louisville, succeeding Dr. Harry S. Sewell.

Dr. D. H. Swengel has been appointed all-time Health Officer for Johnson County.

Dr. J. U. Ridley has been appointed County Health Officer for Henderson County, succeeding Dr. E. N. Powell.

The Hardin County Board of Health was recently organized. The following officers were elected: Judge J. L. Irwin, Chairman; Dr. D. E. McClure, Secretary; Judge J. L. Irwin, Dr. J. M. English, Dr. J. C. Mobley and Dr. H. R. Nusz.

Five sanitary inspectors will be added to the State Board of Health. They will be sent to counties in the State where they are most needed and where they can be used most effectively.

Dr. John W. Moore has been appointed Medical Superintendent of the City Hospital, Louisville.

The new addition to the Moseley Hospital, Henderson, is almost completed.

The hospital to be erected at the Old Folks' and Rebekahs' Home, Eminence, will be erected at a cost of $50,000.

It is understood that Dr. John T. Boldrick, Lebanon, will erect a hospital at a cost of approximately $25,000.

Deaths

Dr. Frank Major Beard, Shelbyville, aged 53, died December 20 from myocarditis.

Dr. Alva B. Coons, Georgetown, aged 62, died December 23 from paralysis.

Dr. Tyron Y. Howard, Niagara, aged 84, died January 4 from cancer of the stomach.

Dr. George Washington Ford, Lynn Camp, aged 60, died December 31 from pneumonia.

Dr. Charles P. Cook, New Albany, aged 65, died suddenly January 7 from apoplexy.

Dr. Ed T. Sallee, Garlin, aged 82, died December 22

Dr. John Karagiozian, Louisville, aged 62, died December 6.

Dr. Benjamin Green Brown, Dalton, aged 71, died December 18, after a long illness.

Dr. J. Ambrose Armes, Leitchfield, aged 52, died December 18.

Dr. Peter B. Davis, Earlington, aged 66, died December 4.

Dr. George Draper Kelley, Lexington, aged 56, died recently.

Dr. Frank L. Lebangood, Louisville, aged 72, died December 15, following an illness of several days.

Dr. J. B. Forest, Murray, aged 68, died December 12 from pneumonia.

Dr. Nelson H. McNew, Carlisle, aged 82, died December 13.

LOUISIANA

The Presbyterian Hospital, New Orleans, celebrated its fifteenth birthday in the Corinne Casanas Memorial Building January 20. The service of the Hospital to the sick poor in and about New Orleans has been steadily increasing. During the year 1922 the Corinne Casanas Free Clinic for the Poor of the Presbyterian Hospital treated 10,934 patients; 296 of these were served with free prescriptions; 598 free pathological tests were made; 129 free roentgen examinations were given, 19 charity patients were admitted to the main Hospital's beds from the Free Clinic; 128 patients were treated in the Hospital's beds as part-pay patients.

The East Baton Rouge Parish Medical Association has elected the following officers: Dr. W. R. Edison, President; Dr. R. B. Wallace, Vice-President; Dr. T. C. Paulsen, Secretary-Treasurer.

Ouachita Parish Medical Society has elected the following officers: Dr. J. W. Walsworth, President; Dr. C. H. Moseley, Vice-President; Dr. P. L. Perot, Secretary-Treasurer.

Orleans Parish Medical Society has elected the following officers: Dr. H. W. Kostmayer, President; Drs. R. Lyons, Elizabeth Bass and F. J. Chalaron, Vice-Presidents; Dr. L. Ledoux, Secretary; Dr. J. A. Lanford, Treasurer.

At the recent meeting of the Rapides Parish Medical Society for the purpose of reorganization of the Hospital Staff, the following were elected: Dr. C. J. Gremillion, Medicine; Dr. R. O. Simmons, Surgery; Dr. J. L. Wilson, Gynecology and Obstetrics; Dr. E. R. Gandy, Specialties.

The Shreveport Medical Society has donated its entire library to the public library, Shreveport.

Shreveport Medical Society has elected the following officers: Dr. Lewis H. Pirkle, President; Dr. W. P. Butler, Vice-President; Dr. C. C. Sims, Vice-President; Dr. R. T. Lucas, Secretary; Dr. L. C. Spencer, Treasurer.

The Baptist Hospital, New Orleans, contemplates additional buildings.

The Hotel Dieu, New Orleans, will erect a six-story addition at a cost of $750,000.

A free clinic has been opened in the City Hall Annex by the New Orleans Health Department. Dr. W. H. Reilley will be in charge of the venereal clinic and Dr. J. C. Cole will be in charge of the tuberculosis clinic.

The Orleans Parish Eye, Ear, Nose and Throat Club has elected the following officers: Dr. A. J. Weil, President; Dr. Wm. T. Patton, Vice-President; Dr. C. A. Bahn, Secretary-Treasurer.

A new clinic has been opened by the Union Indemnity Company, New Orleans.

Dr. Urban Maes, New Orleans, was elected Treasurer of the Southern Surgical Association at its recent meeting in Memphis, Tenn.

The new addition to the Touro Infirmary, New Orleans, will be erected at a cost of $500,000.

Dr. K. E. Miller, Surgeon, U.S.P.H.S., has been detailed to Louisiana to aid in the campaign against dengue fever.

A new maternity clinic has been opened by the Child Welfare Association, New Orleans, with Dr. E. L. Zander in charge.

It is understood that the Presbyterian Hospital, New Orleans, will erect a new building in the rear of its present plant at a cost of $1,000,000.

Dr. Wm. T. Patton, New Orleans, has been elected President of the Kiwanis Club of New Orleans. Dr. T. B. Sellers was elected one of the Trustees.

Drs. Arthur G. Heath and Thomas P. Lloyd, Shreveport, have been elected members of the local Board of Health.

Dr. Florau William Dirmann, Jr., and Miss Mabel Rita Ladet, both of New Orleans, were married November 30.

Dr. Ralph P. Evans and Miss Barbara Neal, both of Alexandria, were married December 15.

Deaths

Dr. Martin Luther Sexton, New Orleans, aged 64, died December 1.

Dr. Henry C. Hornung, New Orleans, aged 73, died recently from acute bronchitis and asthma.

Dr. Jinkens L. Schley, Homer, aged 38, died December 14 at a sanitarium in Shreveport from organic disease of the heart.

Dr. Charles Fox Howell, Laurel Hill, aged 63, died November 17.

MARYLAND

The corner-stone of the Baltimore Municipal Hospital, a new hospital for infectious diseases for Baltimore City, at Lake Montebello, has been laid. The seven buildings now under construction will cost approximately $643,000, exclusive of grounds and furnishings. Dr. Birckhead MacGowan will become Director of the new Hospital. The City Infectious Hospital, of which he is now Superintendent, will be abandoned.

The opening of a ward unit for men of moderate means in the urologic department has been announced by the Trustees of the Johns Hopkins Hospital. A generous gift has made it possible to maintain in part, for several years, a ward unit for those who require hospital treatment, but cannot afford expensive private rooms and professional fees.

The following have been reappointed members of the State Board of Health: Dr. John S. Fulton, Director of Health, formerly Secretary of the State Board of Health; Drs. William H. Welch, Benjamin B. Perry, William W. Ford, E. F. Kelly and Tolley A. Biays.

On December 18 the one hundred and fiftieth anniversary of the University of Maryland, Baltimore, was celebrated. The school was organized in 1807 as the College of Medicine of Maryland. In 1812 it became the University of Maryland School of Medicine; in 1913, it took over the Baltimore Medical College; in 1915, the College of Physicians and Surgeons of Baltimore was merged with it.

Dr. Keith Rice has been appointed by the staff of Johns Hopkins Hospital, Baltimore, as Assistant Resident Surgeon in the Church Home Infirmary, a branch of Johns Hopkins.

Dr. J. Knox Insley has been appointed Commissioner of Labor and Statistics for Maryland.

Dr. Myron G. Tull, Camden, N. J., has been appointed Resident Physician at the Sydenham Hospital, Baltimore.

Dr. Leo Brady, Baltimore, and Miss Lucy McCormick Jewett, Chicago, were married December 5.

Deaths

Dr. Alexander R. Mitchell, Hereford, aged 67, died December 12 at the Mercy Hospital, Baltimore.

MISSISSIPPI

Dr. H. H. Howard, of the International Health Board, on January 1 started a five-year campaign in Jones county against malaria. Dr. Howard will have three assistants, as well as medical students wishing to study malaria.

Deaths

Dr. Jesse Beale Gallaspy, Newton, aged 40, died December 14 from heart disease.

MISSOURI

Clay County Medical Society has elected the following officers: Dr. E. E. Peterson, Nashua, President; Dr. J. E. Baird, Excelsior Springs, Vice-President; Dr. J. J. Gaines, Excelsior Springs, Secretary-Treasurer.

Jasper County Medical Association has elected the following officers: Dr. R. M. Stormont, Webb City, President; Dr. L. C. Chenoweth, Joplin, Vice-President; Dr. James I. Tyree, Secretary; Dr. M. C. Shelton, Treasurer.

Lawrence-Stone County Medical Society has elected the following officers: Dr. T. T. O'Dell, President; Dr. W. N. Detherage, Galena, Vice-President; Dr. R. C. Robertson, Aurora, Secretary.

Randolph County Medical Society has elected Dr. G. O. Cuppaidge President.

St. Louis County Medical Society has elected the following officers: Dr. W. F. O'Malley, Webster Groves, President; Dr. Robert B. Denny, Creve Couer, Vice-President; Dr. Otto W. Koch, Clayton, Secretary-Treasurer.

December 3-10 was observed as School and Health Week in the State. The State Department of Education, the State Board of Health, the Missouri posts of the American Legion and the Rotary clubs cooperated with the Missouri Tuberculosis Association in observance of the week.

Miss Ranz has been appointed Superintendent of the Audrain Hospital, Mexico, succeeding Miss Reitz.

Dr. A. H. Horn has been elected a member of the medical staff of State Hospital No. 1, succeeding Dr. F. H. Mapes, resigned.

The new high school on Natural Bridge Road, St. Louis, will be named in honor of Dr. William Beaumont, who served as President of the St. Louis Medical Society in 1841.

A fifty-bed hospital will be erected at Sarcoxie at a cost of $112,694.

An out-patient department of the Boone County Hospital has been organized. The object is to provide free medical service for all who are unable to pay.

Dr. J. F. Harrison has been reappointed Physician of Audrain County.

Miss Flowers, St. Louis, has been appointed Superintendent of the Galloway County Hospital, Fulton, succeeding Mrs. Wilcox, resigned.

Mrs. Hannah Duryea in her will bequeathed securities valued at more than $50,000 to the St. Louis University to be used for dispensary purposes in connection with the medical school.

The corner-stone of the new St. Mary's Hospital, St. Louis, has been laid.

Deaths

Dr. Isaac M. Minton, Fortescue, aged 67, died November 11 from heart disease following an operation.

Dr. Leo Caplan, St. Louis, aged 57, died November 25 in Vienna, Austria, from carcinoma.

Dr. Callie Singleton Walker, Kansas City, aged 69, died December 10.

Dr. Louis Willard Luscher, Kansas City, aged 64, died December 26.

Dr. Thomas Hazen Humphreys, Kissee Mills, aged 59, died December 25, after a few hours' illness.

NORTH CAROLINA

Buncombe County Medical Society has elected the following officers: Dr. Charles Hartwell Cocke, President; Dr. Lewis

(Continued on page 36)

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

CLINICAL STUDIES*

By M. L. Graves, M.D.,
Galveston, Tex.

Clinical is derived from the Greek word Kleinikos, which means a bed and signifies in medical usage the consideration of those persons confined to bed by illness. Hence clinical studies would constitute the painstaking examination of the sick at the bedside. The ambulant sick must also be included.

If Hippocrates be rightly considered the father of medicine, he must also be esteemed a great clinician, for he was the leading figure in the medical school at Cos, and his reputation for the study and healing of the sick, taken to him from many places, spread over the European continent and still dominates medical history. It is gratifying to remember that the fathers of medicine in all its branches were men particularly devoted to bedside study. We are told in Garrison's "History of Medicine" that Rhazes made a thorough study of measles and smallpox and produced in the Arabic language the first authentic account in literature of these two infections. From the same source we learn, in early Mohammedan medicine, that diagnosis was founded on:

(1) The patient's actions; (2) his excreta; (3) the nature of pain; (4) its site; (5) swelling; (6) the effluvia of the body; and (7) this was supplemented by manual examination (Garrison).

Certainly these ancient practitioners set a notable example of careful investigation of the sick, not to be despised by modern students, who too often deliver clinical investigation to the shorter methods of the laboratory and look to its revelations for diagnosis with little labor. If one discards the early dogmas of spirit infestation and reviews the progress of clinical study in a single disease, such as hysteria, still unsolved, it will be seen that tremendous progress has been made from the early Greek conception of this disease as a theoretical travelogue of the uterus to various portions of the human body in search of sexual satisfaction, producing in these unnatural locations bizaare and unusual symptoms. It was a far cry from this Grecian concept of the typical neurosis to the more considerate and scientific view of Lepois, followed by Sydenham, which recognized that these peculiar nervous manifestations had a basis in bodily disorder and necessitated careful examination.

The last great step in a comprehending psychology of this malady was taken by Babinsky[3] when he declared that hysteria is a pathological state induced by suggestion and curable by persuasion and actually demonstrated both of these facts in many such cases at the bedside.

When the French physician, Louis, had prepared himself by extensive dissection of the human body, he became a great clin-

*Chairman's Address, Section on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

ical leader in pointing out the relation of the structural pathology in the lungs to the physical manifestations in pulmonary tuberculosis. Later he also differentiated

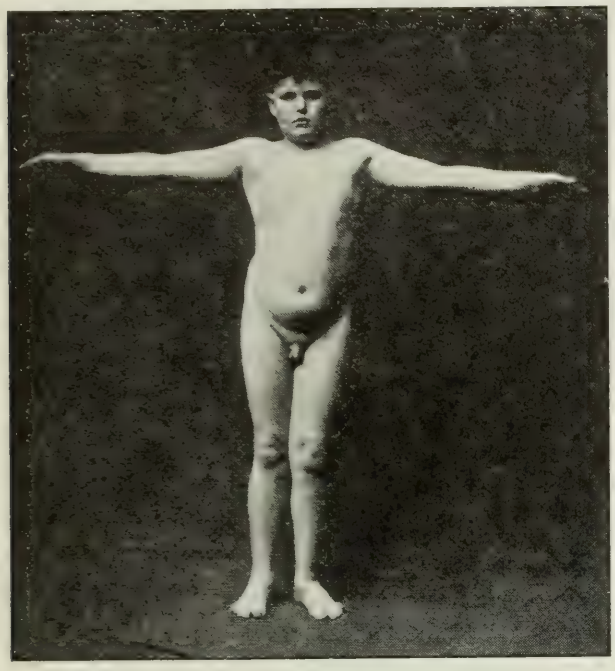

Fig. 1.—Note adiposity of pelvic girdle and mammae. Also poorly developed genitals.

typhus from typhoid fever, making a permanent separation of these two infections and giving to the former its present-day

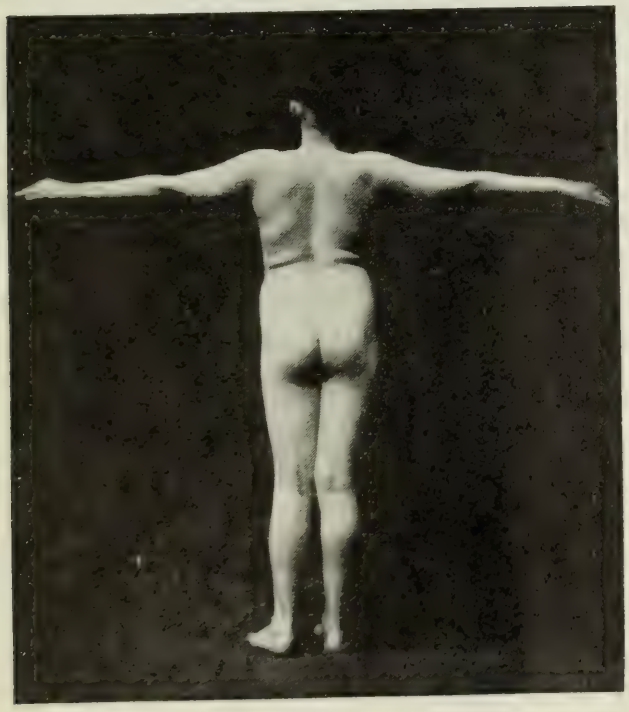

Fig. 2.—Note adiposity of pelvic girdle and scapular regions. Folds of skin.

appellation. Many such illustrations may be given throughout the history of medicine, and it is surprising that amidst the remarkable advances made in the detection of morbid processes in the human body and their somatic expression, so large a

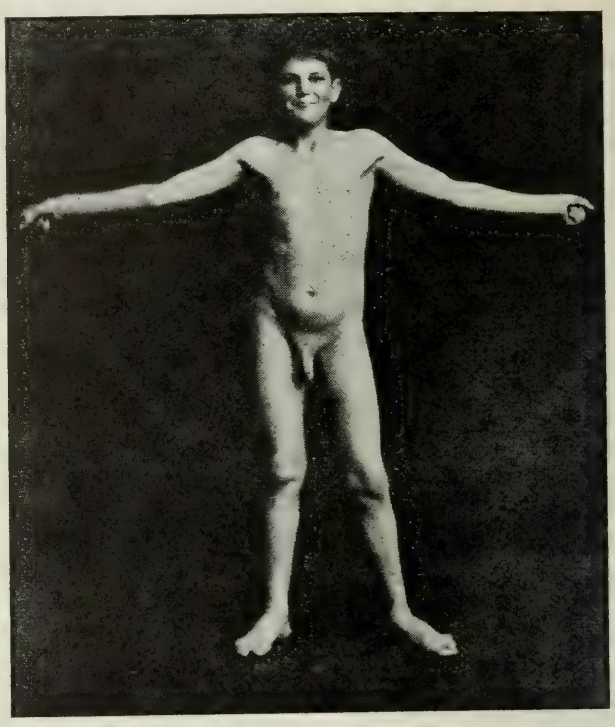

Fig. 3.—Excess adiposity gone. Genital development marked.

number of physicians have ceased to regard careful physical examination and prolonged clinical study of the patient as essential to correct diagnosis and rational

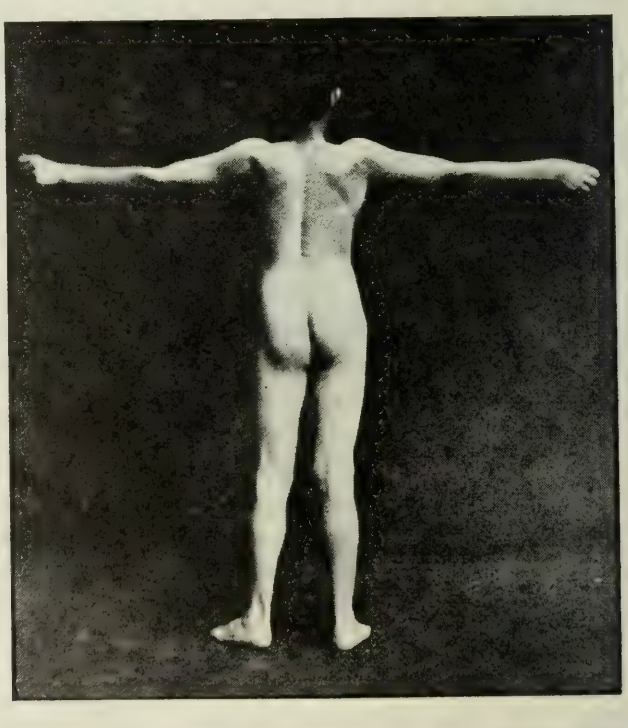

Fig. 4.—Adiposity in pelvic and scapular regions gone.

therapy. They rush to quick and easy laboratory demonstration to avoid the time and painstaking care necessary for the

proper study of the sick. It is noteworthy that the study of the pulse, the action of the heart, the movements of the lungs, tremors and other motor disorders and the

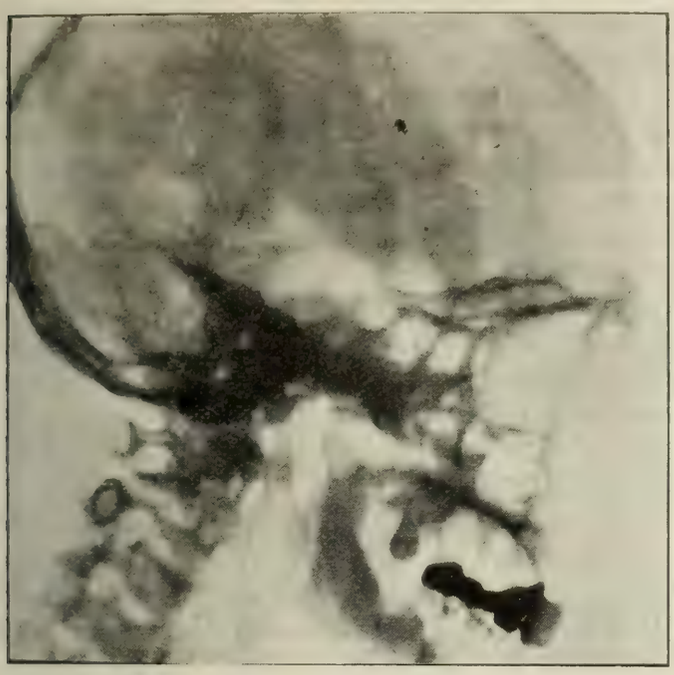

Fig. 5.—Normal sella turcica.

innumerable sensory disturbances of the neurological patient, to say nothing of the interpretation of station, motion, gait, attitude, facial expression and the early pe-

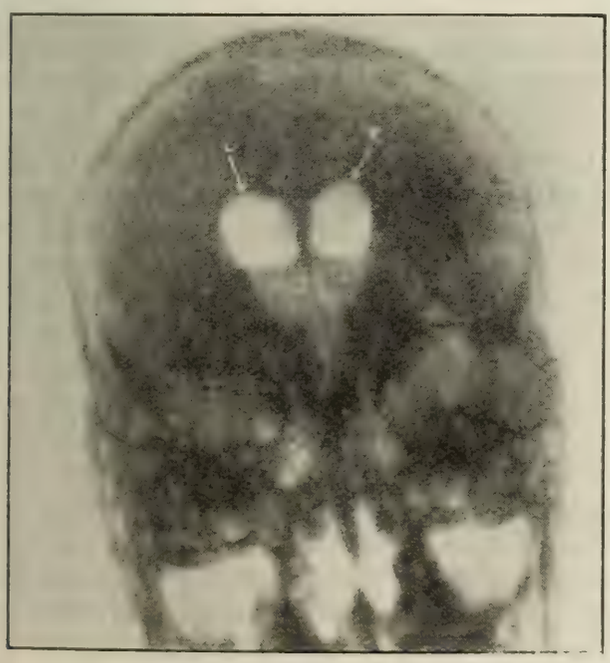

Fig. 6.—Ventriculogram anterior-posterior right and left lateral ventricles.

culiar conduct of the mentally diseased may be illuminating and satisfying. The time-consuming character of such examinations causes insufficient study, errone-

ous interpretation and therapeutic tragedy and nihilism.

It is not to be wondered that so great a clinician as Sir James McKenzie should

No. 7.—Ventriculogram right lateral ventricle 70 c. c. of air. Note clear and normal outline.

denounce our dependence upon the stethoscope and similar instruments of precision, contending that they should be discarded as soon as invented and chief reliance be

Fig. 8.—Left lateral ventricle. Note sharp interruption in contour posterior horn.

placed upon consideration of the patient's departure from normal feeling and conduct. It is true that the recent group organizations in medical practice have done much, by thorough anamnesis and phys-

ical and laboratory examinations, to make bedside revelations more accurate and useful to the patient. But some of the weaknesses of this improved service are now becoming apparent in the total absence often of the experienced clinician with years of patient and comprehensive study as the background of competency, to act as the integrator of the various opinions rendered by different specialists and to become the arbiter of conflicting views and the final adviser to the patient concerning the various ills usually reported and their relative importance, and to the establishment of a regime, surgical, medical and otherwise, for the restoration of health.

We all see patients even from important clinics with numerous colored slips of paper, which tell in professional hieroglyphics the results of special examinations. At the end of a dizzy round of a week or two, the patient is utterly unable to give any coherent account of what was considered to be the matter with him or what he had to do "to be saved." It is especially important, as was insisted upon by Sir James McKenzie, that thorough familiarity with the earliest symptoms of disease and due consideration of the personal experiences of the sufferer over years of progress in the insidious and chronic diseases particularly, closely and carefully observed, are necessary both to understand and to evaluate symptoms. No hurried survey at any one period of a patient's life can reveal the whole morbid story, even to the most thorough and conscientious of examiners. Hence, many of these patients after expensive and disillusioning visits to such clinics or to consulting practitioners, return to drag out their lives of invalidism, frequently losing confidence in the profession and turning to the swarming schools of irregulars, so rich in promise and so poor in performance.

Further, the enthusiasm today lavished on finding what is the matter with the patient and attaching various names to superficial and other pathological lesions, has become well nigh a craze and the paucity of remedial measures, where surgery is not applicable, is humiliating and disheartening. It is not rare to find a patient slowly progressing to a fatal termination from an insidious and remitting pellagra without classical symptoms, or from some other equally elusive disease, flourish a diagnostic chart exhibiting his gingivitis, chronic tonsillitis, rhinitis, astigmatism, conjunctivitis, gastric hypo- or hyper-chlorhydria, enteroptosis, vascular hypo- or hyper-tension, normal or abnormal blood chemistry, pelvic displacements, suspicious thoracic shadows and indisputable roentgenographic evidences of duodenal ulcer, gall bladder disease, intestinal, peritoneal and omental adhesions, as an adequate explanation of his symptoms. Upon operation the doctor finds that he has been following an *ignus fatuus* of ancient philosophy, medical superficiality and self-satisfaction.

The writer rejoices in the present-day spirit of earnest investigation manifest in many ways and places, and trusts that these rather fitful evidences of widespread carelessness and superficial and insufficient clinical observation and desire for results without labor will begin to decrease. With a fuller comprehension of our duty and with a greater devotion to our responsibility, we may address ourselves anew to clinical observation for the correct interpretation of the signs and symptoms of disease now obscure or unrecognized by our present methods of study.

In urging the great importance of clinical studies, the writer desires to record and report the following histories of two cases presenting interesting phenomena. The one exhibited in childhood the infrequent syndrome of Frohlich, slowly unfolding, with attacks identical with and indistinguishable from, idiopathic epilepsy, with apparent results of treatment both successful and unsuccessful. The other displayed progressive and compelling evidence of the nature of the lesion, with inconclusive evidence from the laboratories. The surgical attack was disappointing yet revealing. The final illumination of the post mortem completed the observation of a hopeless condition.

Case I.—In November, 1918, R. L., a white boy of eleven, came under observation complaining of epileptic attacks. His family history was exceptionally good. The father, mother, three sisters and three brothers were living and well, with no

evidence of degenerative diseases except family adiposity.

P. I.—He had convulsions from birth to three days of age; measles at 9; pertussis at 10; and was in normal health until January, 1918, when a nocturnal convulsion occurred, said to have lasted three hours. In July, 1918, another occurred, and in two weeks there was a third severe attack. All of these attacks occurred at night and were evidently tonic and clonic convulsions. The tongue was bitten each time and involuntary urination and invariable vomiting occurred.

P. E.—The patient was somewhat stouter than normal. This was at first considered a family characteristic, as the father had weighed 266 pounds, the mother 180 and the other members of the family were all above normal weight. The patient's weight was 95 pounds; his blood pressure, 90/56. He had chronic hypertrophied tonsils, a high arched, rather Gothic type of hard palate; nothing particularly wrong in the cardiovascular, respiratory, gastro-intestinal or nervous systems. The pupillary reflexes were normal and the patellar lively, but not pathological. The penis and testicles were smaller than normal for a child of his years and the adipose tissue showed something of the girdle with rather prominent mammary development; but these abnormalities were then too small for anything but slight suspicion of endocrine disturbance. The blood count was:

Hemoglobin	101%
Red cells	5,100,000
White cells	12,100
Polymorphonuclears	69.5%
Transitional	4.5%
Large mononuclears	3.5%
Lymphocytes	19%
Eosinophiles	3.5%

The Wassermann was negative; the urine negative; the stool negative for parasites or ova to cause even the small eosinophilia.

He was not seen for six months, when he again reported with history of three or four attacks of what his physician considered typical epilepsy. There was no substantial change in appearance or condition except that the blood pressure was 108/70, the weight 107½ pounds and the disposition of the fatty tissue about the same. Luminal was prescribed in tablets of 1½ grains. Certain restrictions were placed on the diet, particularly in reference to the proteins and to over-indulgence in sweets, with regulation of the alimentary excretion.

In November, 1920, no permanent improvement had occurred and several more attacks had occurred both in the day and night. An x-ray examination of the head was ordered and the sella turcica reported normal both in shape and size. The roentgenologist, Dr. A. S. Holley, also advised that there was evidence of increased intracranial pressure, especially localized in the left temple area. No sensory or motor phenomena, either general or local, confirmed this suggestion. Mammary and girdle obesity were somewhat increased, but still no convulsions had occurred and his conduct had been normal. The testicles and penis were not developed and stronger suspicion of Frohlich syndrome was aroused. It was noted on his chart that he looked like a mild Frohlich.

On December 30, 1920, a photograph was made and he was put on ½ grain of thyroid and 2 grains of whole pituitary gland. The suspicion of bilobar hypopituitarism and perhaps coincident deficient thyroid activity were present and were considered responsible for his apparent dystrophy.

In January, 1921, the whole gland was discontinued for a while and the anterior pituitary substance administered. He reported for further observation on March 31, 1921, when the following notation was made: "Mammae still large, no change. Abdomen protuberant. Larger fatty deposit about the girdle in the hypogastric area and about the mons. Penis and testicles somewhat larger, but still much smaller than normal. The thymus gland particularly enlarged from the first to the third rib, and to the left and behind the sternum. The general obesity appeared increased."

The patient was bright and normal in appearance and conduct and had had no further convulsions. During the year 1921 variations were made in this treatment without very definite knowledge of the values of the treatment, but the convulsions had been controlled. Later the thymus gland was added to his therapy from the suggestion in the literature that it had some influence in the development of the reproductive organs. This and pituitary substance were continued intermittently with luminal tablets until November, 1921, when he weighed 130 pounds, and all medication was ordered discontinued except the whole pituitary in 2 grain doses three times a day. By some mistake his family continued one tablet of 1½ grains of luminal daily.

In March, 1922, the patient was again seen. The testicles were still small. The penis measured 5.5 cm. in length and the adiposity was unchanged. The diagnosis of dystrophia adiposis genitalia was considered established and confirmed, but in the absence of more definite knowledge of endocrine therapy the treatment was continued. New tablets of the whole pituitary were secured.

On August 8, 1922, the patient came again. His weight was decreased to 92 pounds. He had lost 38 pounds during the preceding six months. The adipose tissue was everywhere reduced. The patient appeared more normal in stature and configuration. The penis measured 9 cm. long. The testicles were much increased in size, the left approaching normal. A few hairs appeared on the pubis. The mind was alert, the appetite good, digestion active, and no convulsions had occurred since December. The patient had done well in school.

On October 8, 1922, further examination elicited the following notation: "Penis 10.5 cm. long; 9 cm. circumference. Left testicle 5 cm. long. Right testicle 3 cm. long. Pubic hairs more numerous, some about 1 inch in length. No axillary hair."

The adipose abnormalities had entirely disappeared. The weight was 95 pounds; the height

1 m., 56.5 cm.; span 1 m., 58.5 cm.; and lower extremities 81 cm. Photograph will show comparative changes since the previous picture.

After this gratifying improvement in general health, both mental and physical, and the rather rapid disappearance during a period of seven or eight months of all unusual adipose deposits and the good condition of the patient, all medication was discontinued. Three or four days afterward there was a return of convulsions, about six of the status type occurring in rapid succession. He was again placed on pituitary and luminal, and no further disturbance has occurred.

This chequered history is here reported, as it appears we were dealing with one or more of three distinct disease entities: idiopathic epilepsy, dystrophia adiposis genitalia, or hypopituitarism with epileptiform attacks and abnormal fat deposits genital hypoplasia known as Froehlich's syndrome.

It was hoped that the marked improvement manifested indicated that his pituitary dysfunction was responsible for both conditions and that relief would be secured pari passu; but this hope was delusive. Cushing and others have reported epileptiform attacks in hypopituitarism. The stumbling therapy of this case is detailed not because of its scientific character, nor from any certainty that the final improvement in the dystrophia was due to it, as it may have been nature's own correctional development. The writer believes that the prompt changes following the last administration of pituitary indicated an efficient therapeutic agent.

This case illustrates a confusing syndrome. The delayed recognition of the Frohlich complex was not considered excusable, although in a developing child with an unusually large family adiposity and concentration of our attention upon the convulsive diseases, frank and early recognition of a developing and different disease is not easy except to those having a larger experience in endocrine disorders. Perhaps the record of this case may stimulate earlier recognition, more comprehensive and complete clinical analysis and more rapid and successful therapy in the practice of others.

Case II.—W. O. R., a stock farmer, was an ex-service man, white and 27 years old. His chief complaint was nervous trouble. His father, mother and two sisters and three brothers were living and well. One sister died at childbirth.

Personal History.—He had had the usual diseases of childhood, but no injuries. Slept well, had a good appetite, and took no alcoholic drink. He smoked cigarettes to excess.

Present Illness.—Seven and one-half months previously he noticed numbness and tingling in the right hand, extending all over the right arm and then to the right leg, and finally to the right side of the face in rather rapid succession. This was followed by a feeling of weakness in the right arm and leg. The numbness and weakness continued to grow worse until he became clumsy in his actions and could not hold or pick up things with his right hand and could not tell what they were when examined with his right hand.

About three months later double vision appeared, which continued. The eyesight was good when he closed one eye and he was able to read fine print as well as ever. Recently eyesight became impaired. When arising after sleeping, dizziness occurred and he experienced a tendency to fall to the right side more than to the left. After being up for a few minutes, all dizziness disappeared.

Some headache had been present from time to time, but was not severe and usually occurred after sleeping. It was always on the left side in the left fronto-tempero-parietal region and might be in the left occiput. It lasted for several hours at a time and then disappeared to recur. The hearing had been good. The bowels were constipated. He denied venereal history.

Physical Examination.—His appearance was healthy. His usual weight was 158 pounds, and his temperature was normal.

Gastro-intestinal Tract.—His tongue was coated and yellowish white. He had fine tremors. His gums, teeth and tonsils were negative. His liver and spleen were normal to percussion and palpation. There was no tenderness or muscular hypertension or distention of the abdomen.

Cardio-Vascular System.—The systolic blood pressure was 122 and the diastolic 78. The pulse rate was 80, with regular rhythm. The heart and arteries were negative.

The respiratory system was negative. There were no rales, dyspnea or other symptoms.

Genito-Urinary System.—He had a varicocele on the left side. The left testicle was lower than the right. There was no lesion of the genitalia.

Nervous System.—His mentality was good.

Sensory.—Astereognosis was complete in the right hand. The patient was unable to distinguish objects at all. He was able to distinguish gross difference in weight. On the left side there was perfect recognition. The entire right side of the body, face, trunk, arm and leg, showed diminution of all forms of sensation.

Touch.—Light touch with cotton was especially diminished over the right hand and right face.

Pain.—Sensation was diminished, but not so much as touch. His temperature sense was entirely unreliable, particularly over the back of the trunk, the right hand and arm and the right leg. He felt cold as hot.

Motor.—He had a slight paresis of the right side of the face. The right angle of the mouth was lower. Wrinkling the brow, whistling and other muscular movements showed lagging and diminished activity on the right side. He had paresis of the right arm and hand, particularly the distal extremity and to a less extent the right leg.

Eyes.—He had a paresis of the right external rectus, producing slight internal strabismus. Both superior recti muscles were paralyzed so that the eyes could not be elevated. The left was worse.

He had a slight horizontal nystagmus, but variable.

Reflexes.—These were active, and equal on both sides.

Station.—There was a slight static ataxia.

Motion.—The patient walked with a cerebellar gait, feet wide apart, rather short steps, head tilted backward, chin sometimes turned to the right, and increased by turning or suddenly stopping. There was an apparent tendency to fall backward and to the right, though this varied.

Muscular Atrophy.—Coordination of the muscles, such as touching the nose, putting fingers end to end, was apparently undisturbed, except that past pointing was present in the right hand. At times the patient past pointed about 3 or 4 inches to the right. At other times it appeared normal.

Blood Count.—April 21, 1922:

Hemoglobin	99%
Red cells	5,060,000
White cells	7,800
Polymorphonuclears	63%
Transitionals	3%
Large mononuclears	2%
Lymphocytes	31%
Basophiles	0
Eosinophiles	1%

Blood Wassermann.—April 22, 1922, negative. Cholesterin and acetone insoluble antigens.

Urinalysis.—April 21, 1922: Color, yellow; appearance, clear; reaction, acid; specific gravity, 1025; albumin, negative; sugar, negative; epithelium, occasionally; leukocytes, occasionally; mucus, good deal.

Spinal Fluid Examination.—April 22, 1922: Appearance, clear; pressure, normal; globulin, positive +; Fehling reduction, positive; organisms, none; cells, 35 per c. mm.; Lange's, negative; Wassermann, negative.

Report of eye and ear examinations by Dr. S. M. Morris as follows April 25, 1922:

Fundus.—Double choked disc. Two dioptres right eye; 3.5 dioptres left eye.

Vision.—O.D. 20/30—20/20w—0.755 — 0.25 C. Ax 180) without a cycloplegic. O.S. 20/20 — —20/20w— 0.24 C. Ax 180)

Fields and Form.—No contraction.

Ocular Muscles.—Paresis of both superior recti, more marked on right side. Possibly slight paresis of right external rectus. Right internal strabismus. Diplopia in all directions except extreme abduction to the left. Horizontal nystagmus of the irritative type in all positions of the eyes.

Vestibular Reactions.—When ears are douched with cold water, reactions are normal in every respect except that they are slightly delayed on the right side.

Hearing.—Somewhat impaired on right side, probably due to chronic catarrhal otitis media.

Roentgenological examination by Dr. Lechinger was as follows:

"This case shows well marked mottling of the bones of the skull. In the upper portion of the frontal and parietal bones there is a well marked rarefactive osteitis. There is also a fairly marked separation of the lamboid suture on the right side extending upward and inward and curving to some extent to the antrum area. There is a suggestive shadow which does not appear, however, on the lateral view. I am not certain as to the exact nature of this shadow. In the occipital fossa there is an area of much decreased density."

SUMMARY

Symptoms.—Paresthesia right side. Paresis right side. Astereognosis right side. Sensory diminution and perversion right side. Ocular paralysis superior recti and right external rectus. Static and cerebellar motor ataxia. Variable horizontal nystagmus. Diplopia persistent. Vertigo. Nausea. Vomiting. Headache. Choked disc both eyes.

Diagnosis.—Tumor of the brain, location and character undetermined.

On May 2, 1922, the patient entered the Sealy Hospital.

Second spinal fluid examination was as follows May 2, 1922: appearance, clear and colorless; pressure, moderately increased; globulin, normal; Fehling reduction, normal; organisms, none; cells, 1 per c. mm.; Lange's, normal; Wassermann, negative.

Urinalysis, May 24, 1922.—Color, cloudy, pale yellow; reaction, alkaline; specific gravity, 1010; sediment, flocculent; albumin, negative; sugar, negative; leukocytes, few; epithelial cells, fair number, squamous and cuboidal.

Vestibular examination by Dr. Wall as follows May 6, 1922:

Nystagmus.—Looking to right, slight; looking to left, slight; looking up, slight; looking down, slight. To right: Amp. good. Duration, 50 sec. To left: Amp. good. Duration, 15 sec.

Summary.—Romberg, slight; turning head to left, falls backward.

Final examinations June 2, 3, 1922.

The patient remained in the Hospital. Spinal punctures and drainage were continued and on May 20 he had a pneumo-ventriculograph by spinal puncture. Seventy-two c. c. of spinal fluid were withdrawn and 72 c. c. of air injected. This was performed by withdrawing and injecting 4 c. c. at a time with the patient in a sitting position.

A copy of the ventriculogram is attached.

The report of Dr. Lechinger is attached.

On May 31 the patient complained that the left side of the face felt numb and thick and swollen and that food appeared to collect in the left cheek.

June 3, 1922, the sense of stiffness of the lip has extended to the right side. He felt unable to get food from between the lower lip and teeth with the tongue and used fingers to remove it. His headaches were more severe and frontoparietal on the left side. There was tenderness on pressure in fronto-tempero-parietal area 4.5 cm. above the ear and covering a space of 4x5 cms.

Taste.—Normal to galvanic current on both sides of the tongue. Salt and bitter were imperfectly recognized on both sides with no apparent inequality.

Sense of Smell.—No anosmia. He smelled equally well on both sides tincture valerian, milk of asafoetida, and aromatic spirits of amonia.

Sense of Position.—On right side it was not accurate. His perception was unreliable, but not markedly abnormal.

Superficial Reflexes.—The epigastric and abdominal were diminished on the right side. The cremasteric was apparently equal on both sides.

Plantar reflexes showed slight tendency to extensor response on the right.

Paresthesia and sensory disturbances to touch. Pain and temperature were still further diminished on the right side. Temperature was very imperfectly recognized over the right trunk, hand and leg. Cold was recognized as heat, though not in all localities. Persistence of sensation was experienced in the right side after the neck had been pricked with a pin.

Motion.—Paresis of the right side of the body was more pronounced, particularly over the right angle of the mouth and the right frontalis.

Paresis and paralysis of ocular muscles remained the same.

The ataxia was more pronounced.

Astereognosis of the right hand was absolute. The patient was unable to distinguish the quality and texture of different articles. Vision was diminished and diplopia present.

Diagnosis.—Subcortical tumor of the brain.

Location.—Posterior to the fissure of Rolando and above the fissure of Sylvius, involving the tracts of the post central, parietal and angular lobules on the left side and extending downward so as to produce pressure on the ventricles and internal hydrocephalus.

Against this location the ventriculogram shows the posterior limb of the right lateral ventricle cut off, and I can offer no adequate explanation of this.

Character of Tumor.—The age, rapidity of growth and character of symptoms led me to believe that the tumor was a glioma or sarcoma.

Surgical exploration was advised, but the patient and friends were informed that the tumor might be situated in the base, be irremovable, and only some temporary relief from pressure be obtained. The sufferer insisted upon operation and accordingly Dr. J. E. Thompson did a decompression of the left side on June 7, 1922. Nothing found. The following is the surgical report.

DECOMPRESSION OPERATION, JUNE 7, 1922

The osteoplastic flap over the left parietal region was thrown up. Condition immediately following operation was good. The patient was found to be in a comatose condition twenty hours after operation. His respiration was slow and stertorous and his pulse full and strong. There was considerable edema of the left side of the face and right hemiplegia. The patient was quiet. A puncture of the left ventricle was made and about 4 ounces of fluid were drained off. The patient became restless. Involuntary movement of the left side occurred freely, but there was no movement of the right side. The head turned to the right. The condition of the patient remained about the same for the next two days except for gradual slowing of respiration. Coma continued. His pulse was good.

At 10 p. m., June 9, puncture of the ventricle was made. Following this some twitching of the face was noted. Forty-five minutes later convulsive movements occurred and continued during the night. He died of respiratory failure.

Post Mortem Record.—June 10, 1922, 12 noon. By V. H. Keilier.

The brain only was removed, immediately after embalming. The operative wound was opened, remainder of the skin cut and the skull cap removed in the usual manner. In removing the operative skin flap, a considerable amount of blood clot was disturbed, and at the anterior and posterior margins of the trephine opening where the Gigli saw had penetrated dura there was some herniation of mushy brain substance. The dural sutures were in place and there was no laceration of the brain under them. On removing the skull cap the dural sinuses were seen to be stuffed with blood, as were all veins, but this was thought to be the result of the recent embalming. No coagulum was present in any of the sinuses.

On removing the brain the vessels of the pia were found somewhat more congested than normal, but this also was probably due to the embalming. The entire surface of the brain was normal except for this congestion and for the following:

(1) Herniation and laceration as the result of operative procedure, as previously noted.

(2) Dilatation of the third ventricle.

(3) Possibly an undue herniation of the cerebellum into the foramen magnum, but this was no greater than is frequently found in non-pathologic brains.

Very careful palpation of the whole brain revealed no difference in texture suggesting tumor. All cranial nerves were normal. Careful inspection showed no alteration in contour indicating tumor. It should be mentioned that in removing the brain the lacerated areas at the operative site might have allowed the escape of fluid as the skull cap was removed. The injection of formalin was so recent that the configuration would not have been preserved had this occurred. At any rate, there was no evidence of greatly increased intracerebral tension except in the dilatation of the third ventricle already noted.

Section was made horizontally through the level of the corpus callosum. Except for the dilatation of the ventricles (which was more marked than after further fixation in formalin later on) nothing abnormal was noted.

Another section was cut just below the level of the highest part of the cerebellum, the brain being carefully supported so as to make this section as accurately as possible. The left thalamus presented a non-encapsulated hemorrhagic tumor

about the size of an English walnut or a little larger, which extended beyond the median line.

The brain was not examined further at this time in order that it might be properly hardened and cut with greater precision. The gross description was made by Dr. William Keiller and here follows:

Description of section of the brain by Dr. William Keiller:

A section was cut June 16, 1922, after thorough hardening.

(1) A horizontal section was cut through the lower level of the body of the corpus callosum, opening an upper view of both ventricles. The left ventricle was decidedly dilated. Corpus callosum showed hemorrhages on the left side. The right side was normal, and was cut at a slightly lower level than the left. On the other side the section was just above the caudate nucleus. The left ventricle was slightly dilated. The left half of the corpus callosum showed small hemorrhages. The left choroid plexus was apparently normal. The upper surface of the thalamus showed some small hemorrhages. Centrum ovale behind the trigonum ventriculi was disorganized as a result of the operative trauma.

(2) This section cuts the thalamus about 1 cm. beneath its highest point. Both caudate nuclei were apparently normal. The right side was normal except for considerable dilatation of the right ventricle. The left lateral ventricle was somewhat invaded by the tumor. The left caudate nucleus, lentiform nucleus and internal capsule were normal. The left thalamus showed some dark discoloration which suggested that the level of the tumor was just reached. The upper part of the thalamus, that included the cortico-thalamic fibres, appeared to have escaped and the tumor at this level mainly occupied the medial thalamic nucleus, the anterior escaping. The optic radiation on the left side was interrupted by disorderly brain substance the result of operation.

(3) Section 0.5 cm. deeper than the above. The right half was normal. The posterior horn of the left lateral ventricle was slightly dilated. Except for the disorganization due to operation, the optic radiation was apparently normal. The caudate nucleus, lentiform nucleus and anterior limb and genu of the left internal capsule were normal. There was possible invasion of the posterior limb of the left internal capsule by the tumor. The thalamus, including the pulvinar, seemed to be rather completely involved. The pineal gland was compressed. The lateral geniculate body probably escaped. The upper part of the third ventricle was reduced to a slit by the pressure of the thalamic tumor somewhat beyond the middle line. The median nucleus of the thalamus was most completely involved, and was probably the earliest part affected.

(4) Showed very little owing to the irregularity of the section made at about this level at the time autopsy was performed.

(5) Section touched the upper limit of the cerebellum. Here the tumor was much more extensive. There was much blood staining. The mass projected well to the right of the median line and appeared to involve the left corpora quadrigemina, as well as the greater part of the thalamus. This section was at the level of the lower margin of the aqueductus cerebri. The left ventricle at this level showed no evidence of compression, but there was probably dilatation of the middle horn of the right ventricle. Section of the tissue had been taken from this for microscopic examination.

(6) One-half centimeter below Section 5. The middle horn of the right ventricle was probably slightly dilated. The tumor projected well beyond the middle line and was bounded by the much elongated aqueductus cerebri. What was probably the right superior quadrigeminal body and part of the tegmentum was stretched along the right margin of the tumor. The tumor here measured 3 cm. laterally and 4.5 cm. antero-posteriorly. It was irregularly mottled, parts being somewhat intermediate in color between white and gray substance, while the bulk of the mass was deeply blood tinged. These areas were spongy in texture and had the appearance of a very vascular growth and not of interstitial hemorrhage. Surrounding the spongy area was an area which varied from deep brown to black in the formalin-hardened specimen and was evidently hemorrhagic. The tumor here occupied the whole of the basal part of the thalamus and the left quadrigeminal body. The middle horn of the left lateral ventricle was only slightly if at all dilated. The cortex of the superior temporal convolution showed operative trauma.

(7) One-half centimeter below Section 6. The section on the right was at a lower level than on the left. Right crus cerebri was somewhat distorted, as was also the right red nucleus. Otherwise the right side was normal. The tumor mainly occupied the left quadrigeminal body, pushing the right over toward the right side. The aqueductus cerebri was dilated into a semilunar slit with an extremely thin roof. The section on the left cut through the middle of the optic tract and the condition at this level suggested that the left external geniculate body with the ending of the left optic tract was invaded. (The patient should have had right homonymous hemianopsia.) The occipital lobe had entirely escaped. The trigones of both ventricles appeared to be equally dilated and there was moderate dilatation of the third ventricle.

(8) One-half centimeter above the floor of the third ventricle. This section passed through the deepest part of the locus perforatus posterior. The ventricles were all slightly dilated at this level. The right crus cerebri, substantia nigra and red nucleus were distorted from pressure, but probably did not suffer to such an extent as to cause disturbance of function. The tumor here appeared to grow to a considerable extent from the left half of the floor of the fourth ventricle; and at this level would probably involve the motor nucleus of the left fifth nerve. It also invaded the left brachium conjunctivum, pressed on the right and probably invaded both halves of the corpora quadrigemina (posterior part). The left

red nucleus was distorted, but probably escaped. There was possible invasion of the lateral portion of the left basis pedunculi. The pyramidal portion of this apparently escaped.

(9) Section through the pons in the place of the brachium pontis showed that the tumor sprang from the left half of the floor of the fourth ventricle and involved the more superficial parts of the floor. The motor and lateral sensory nuclei of the fifth and at a slightly lower level the motor nucleus of the left seventh and perhaps the dorsal nucleus of the cochlear and Deiter's nucleus were probably involved, but from the gross examination alone it was not possible to state this definitely. The tumor projected dorsally into the fourth ventricle, pressing up the roof and slightly invading the fibres on the medial side of the lower end of the corpus dentatum. The choroid plexus everywhere was free.

(10) Section at the level of the lateral ventricular foramen (Key and Retzius) below the tumor. The lowest level of the tumor was 3 mm. above this level.

Microscopic Examination.—The sections were stained with hematoxylin and eosin. Later, sections are to be made with toluidin blue, differential glia stain, and also some of the basal nuclei stained by iron hematoxylin to show which of these nuclei are involved. The tumor sections obtained showed that the shape of the cells and their size differed greatly in different areas. There were many areas in which the bulk of the cells were spindle-shaped with fairly numerous "tumor giant cells" having one or more nuclei. Other areas showed a mixture of spindle and small round cells which were very loosely arranged. In still other areas there were a few fibrils. Almost all of the cells were round with deeply stained nuclei and considerable cytoplasm. Throughout the whole mass there was a dense network of fine glia fibrils, but no fibrous tissue. Throughout all parts of the section there were many blood vessels. Most of these had thin walls and opened perivascular spaces resembling those found in brain cortex. In other areas the walls of the vessels seemed to be composed of the cells of the tumor itself. This evidently formed a complete vessel wall, for there were no signs of interstitial hemorrhage. The diagnosis was glio-sarcoma.

Attention is directed:

(1) To the motor and sensory symptoms in the right half of the body, particularly delimited and exhibiting as the most prominent of the sensory defect complete right-sided astereognosis.

(2) The special symptoms usually indicative of tumor of the brain.

(3) The confusing character of the ventriculogram, correct interpretation of which awaited post mortem.

(4) The revelation of the surgical attack, confirmed later by post mortem examination, furnishing positive proof of the inaccessibility of certain cerebral tumors, notwithstanding the advanced surgical technic, the helpfulness of ventricular radiographs and the confidence of some operators that there is now no brain tumor which may not be surgically attacked.

(5) The absence of pain and other deficiencies in the so-called thalamus syndrome made positive recognition of the tumor originating in the thalamus doubtful, and subcortical tumor was therefore considered more probable, an error indicated by the surgical operation and confirmed by the post mortem examination.

THE RIDDLE OF UREMIA*

By David Riesman, M.D.,
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The problems of clinical medicine never grow less. It is true of them as some great scientist once said of facts in general, that the sum total of those unknown is greater than the sum total of those known. When the germ causes of diseases were discovered, men in the first flush of their enthusiasm thought that the veil hiding the nature of these diseases had been completely drawn away. But we are now realizing that only a corner has been lifted and that a thorough investigation of those obscure chemical and perhaps mechanical conditions which make it possible for the germ to do its work remains yet to be made. For many years scientific investigators will be kept busy searching out these mysteries, and when they have solved them, new ones will appear. It is well that things are as they are. Thus only is our ambition sustained and our conceit kept within bounds.

With regard to the kidneys and their relation to the body, the same general truths obtain. We are pushing the bounds of knowledge wider, but never to the end. Bowman taught us the structure and guessed with a true scientist's imagination at the functions of the kidney tubules and their expanded portion, the capsule. Rich-

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ard Bright noted the relation of albuminuria and dropsy to certain structural changes in the organ. Ludwig and Haidenhein started an historic quarrel on the nature of the urinary secretion, a quarrel that later generations have continued. Gull and Sutton perceived the important relation between disease of the arteriocapillary circulation and disease of the kidney, while other phases of this problem were studied by George Johnson, Senator, Volhard and Fahr, Widal, Ophuls, and others. Cushny reviewed the Ludwig-Haidenhein controversy and brought his own researches to bear upon the problem, coming to the conclusion that the secretion of urine is primarily a filtration process. Martin Fischer called upon colloid chemistry for light upon the nature of Bright's disease. Straus, Widal and many other investigators have thrown light upon the blood changes produced by disease of the kidney. Lastly, has come the work of Richards to give us a more intimate knowledge of the activity of the glomeruli and of the action of drugs upon the glomerular circulation.

In its totality, this is no mean accomplishment of a hundred years' conscientious labor, and yet, compared with what we do not know of the kidney and of its diseases, how insignificant an achievement!

Of the important condition we call uremia, so little is actually known that it constitutes an opprobrium of clinical medicine. Like the cause of cancer, it is an unsolved riddle. We can add almost nothing today to the definition of uremia formulated many years ago by Bouchard:

"Uremia is caused by a complex poisoning in which share in unequal proportions all the poisons introduced into the system or manufactured by it."*

How can the nature, the origin of this complex poisoning be solved? Perhaps by doing what the astronomers are doing in their study of the stars—parceling out the field among many. When pathologists, biologists, physiologists, meet, might they not take up such a subject as uremia and assign special topics under it to different laboratories, to different men? This is a method applicable to many problems in medical and other sciences.

What is uremia? Uremia is the end-result of nephritis, just as coma is the end-result of diabetes. That does not mean that all cases of nephritis must end in uremia any more than that all cases of diabetes must end in coma. The word nephritis is a generic term and includes conditions widely different in origin, course and consequence. For that reason one would not expect all forms of nephritic disease to have an equal tendency to produce uremia. In some, death takes place from other causes before the system has become thoroughly poisoned. The same thing holds true of diabetes mellitus.

Is uremia due to a single poison or to a plurality of poisons? At first sight the great multiplicity of symptoms may be thought to argue against a unitary cause. The complexity of the renal function may also seem to militate against such a conception. There are, however, reasons that make the belief in a single primal poison tenable. We do not know what this poison is—whether it is a toxalbumin or a non-protein poison. Whatever the nature of the hypothetical uremotoxin, this much we know: that it has an affinity for many organs and tissues. It has a tropism for the liver, the central nervous system, the capillaries, the neuromotor mechanism, the adrenals, etc. By attaching itself to these organs and tissues, it disturbs their function, so that whatever part these organs play in the metabolism of the body is bound to suffer. This explains to some extent the great complexity of the syndrome called uremia.

THE ANATOMIC SURSTRATUM OF UREMIA

If we look for a moment into this question, we find conditions most perplexing, for almost any variety of renal lesion may be productive of uremia. Acute as well as chronic nephritis, chronic parenchymatous as well as chronic interstitial nephritis, may be associated with uremia. Nevertheless, there is one form which, above all others, has a tendency to lead to the uremic state, namely, chronic glomerulonephritis, also called chronic interstitial nephritis.

VARIETIES OF UREMIA

Many classifications of uremia have been proposed. That of Widal is advantageous

*Castaigne: Les Maladies des Reins, Paris, 1921.

in practice as well as a fruitful stimulus to research. Widal classifies the manifestations of uremia into (a) those due to retention of chlorids—uremie hydropigene, or dropsical uremia—and (b) those due to retention of nitrogenous substances—uremie seche, dry uremia. The first is sometimes spoken of by French writers as uremie chloruremique and the second as uremie azotemique. These types, however, are not always clear-cut. Transition forms are common. The so-called chronic interstitial nephritis is, as a rule, not associated with dropsy and leads to dry uremia. However, in a fair proportion of cases dropsy eventually appears, either because of circulatory failure or because of progressive renal damage without the interposition of failure of the circulation.

For practical bedside work a classification of uremia upon a symptomatic basis has advantages. On such a basis we may classify the manifestations as (a) nervous, (b) mental or psychotic, (c) visceral, (d) dermal, and (e) mixed.

Let us now study these manifestations in some detail.

(*a*) *Nervous Manifestations.*—Aphasia, monoplegia, hemiplegia, headache, disturbances of vision and of hearing, neuralgia, convulsions and coma.

It is rather characteristic of the motor disturbances — monoplegia, hemiplegia, aphasia — that they are transitory and functional in nature. Yet while they last, they are indistinguishable from those produced by such organic changes as thrombosis or hemorrhage. I well remember an experience I had as pathologist to the Philadelphia General Hospital. A number of cases had been sent to the autopsy room from the nervous wards with a diagnosis of apoplexy, but no hemorrhage was found, the only lesion that could have been held responsible for the hemiplegia being advanced kidney disease. This fact so impressed the neurologists that for a time they made almost routinely the diagnosis of uremia in acute cases of hemiplegia, only to be proved wrong quite frequently, the autopsy showing with irritating perverseness the presence of hemorrhage.

We have no clear knowledge as to the manner in which these transitory functional brain disturbances are brought about. It is possible that the poison acts directly upon the brain cells. On the other hand, it may act primarily upon the blood vessels, causing spasm and depriving the related parts of the brain of blood.*

Uremic Headache.—In its intensity *uremic headache* is comparable to that caused by brain tumor; and since vomiting occurs in both conditions, it is not surprising that the thought of brain tumor often arises. I know of a case in which all preparations for a trephining operation had been made, when at the last moment the real nature of the headache was discovered. Uremic headache frequently radiates down the back of the neck.

Uremic amaurosis is an interesting symptom. It may follow a convulsive seizure or may occur independently of other symptoms.

Uremic neuralgia—trifacial, dental, supraorbital—needs only to be mentioned.

Uremic convulsions generally occur in groups. As many as six, eight or ten may occur within 24 hours. Taken by themselves, the convulsions cannot be distinguished from those of epilepsy. They are, however, preceded more often than is the case in epilepsy by restlessness and are frequently followed by delirium or mild wandering rather than by sleep.

When the antecedents of *coma* are unknown, the condition becomes one of the most perplexing problems in clinical medicine. The temperature in uremic coma is usually subnormal, but it may be elevated to 100, 102 or 103°. Neither the reflexes nor the pupils are of much help. The presence of albumin and casts in the catheterized specimen of urine, hard arteries, large heart and high blood pressure are suggestive of uremia. The finding of a high urea content in the blood comes as interesting, though often belated information.

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*While the disturbance in brain function is usually attributed to deprivation of blood, meaning thereby of nutritive material, I have been led through the work of Barcroft to the belief that it is the cutting off of the oxygen supply, histanoxia it might be called, that is primarily responsible for the diminution or suspension of function.

Both the convulsions and the paralyses are most common in the dry form of uremia, but occur also in the combined form of glomerulonephritis with dropsy, of which I have spoken.

(*b*) *Mental or Psychotic Manifestations.* These may take the form of melancholia or mania, of mild states of mental depression, and of amnesia. I do not wish to imply that uremic intoxication is always the basis of melancholia or mania. That is not true, but since uremia may produce such psychoses, that fact should always be remembered in the study of acute mental cases.

The maniacal type is illustrated by the case of V. D., an Italian, who came to the Philadelphia General Hospital with signs of chronic glomerulonephritis. Soon after admission he had several convulsions. Although the nitrogen retention was very high, the creatinin, for example, being up to 25 mgm. per 100 c. c. of blood, the convulsions ceased after bleeding, alkaline infusions into the blood and sweating. Soon, however, he passed into a more or less maniacal state, during which he was so abusive, vicious and destructive that he had to be restrained. After several days, during which he could scarcely be approached, he recovered and eventually turned out to be one of the most likeable patients in the ward. I have seen this Jekyl and Hyde alternation in other cases. Seeing but a single phase is sometimes misleading.

One of the most remarkable manifestations of uremia I have ever seen is somnolence or narcolepsy. Some years ago a trained nurse came under my observation who had been sleeping for six days an apparently quite natural sleep, from which, however, she could not be aroused. We thought of drug intoxication, but could find no evidence of it. It was before the days of encephalitis lethargica and before it was customary to make routinely blood and other functional tests. The urine was free from albumin, but contained in every specimen some hyaline and granular casts. Our eventual diagnosis of uremia was arrived at by the process of exclusion, and was confirmed at autopsy, which showed two shriveled kidneys not much larger than a silver dollar in diameter, highly granular and typical of chronic interstitial nephritis.

Among the milder manifestations are great irritability and touchiness appearing in patients who previously were of a reasonable and placid disposition. Such a change may be a precursor of uremic convulsion or a sequel of it.

Retrograde amnesia is not an uncommon symptom after any sort of convulsion, but it is more common after a uremic seizure than after the classical epileptic attack.

The great variability presented by the nervous and mental symptoms of uremia depends in part upon quantitative variations in the poison and in part upon differences in individual nervous and mental reactions.

(*c*) *Visceral Manifestations.*—These are almost endless. I shall point out only the most important. With regard to the cardiovascular manifestations we can hardly call hypertension and hypertrophy of the heart uremic symptoms, although in the last analysis they may be due to the same poison. The condition to which I want to call your attention in particular is acute pericarditis, which is not an infrequent incident during the course of chronic glomerulonephritis. Because of the prominence of other symptoms, it is often overlooked; yet it is of great importance since it may be the immediate cause of death. In the majority of cases I have seen, the fluid was bloody. A correct diagnosis can only be made by a daily routine examination of the heart or by an x-ray study.

The blood pressure in uremia is usually high, from 250 to 270 systolic and 150 to 170 diastolic. Such a finding may be of value in the diagnosis, but there is a rather mysterious group called vascular or essential hypertension, in which the high blood pressure is apparently independent of kidney changes, although the symptoms in many respects resemble those of nephritic hypertension.

Sometimes the blood pressure in uremia is low. The patient with uremia, convulsions, mania and hypercreatinemia, whose case I reported above, had a systolic blood pressure of 120 to 130, except on one occasion, when it was 170. I have also seen hypotension, a systolic pressure of 84 to

86, with uremia that at autopsy was shown to be dependent upon contracted kidney. In two such cases the organ was not larger than a silver dollar.

The relation of hypertension and nephritis is obscure. In some cases, perhaps the majority, the primary factor is arterial disease, functional or structural, which extends to the renal vessels as well as to those elsewhere in the body. In other cases some toxic factor injures the kidney, causing a nephritis which — how we do not know—leads to hypertension.

Whatever the process may be, the result is lessened functional capacity of the kidney, and in consequence greater impermeability to waste products.

The most important of the *blood changes* is the accumulation in the blood of non-coagulable nitrogen. Our knowledge of this important subject we owe to Straus, Widal, Ambard, Folin, McLean and many others. A very large share of the work has been done in this country.

Of the non-protein nitrogen, urea constitutes by far the largest fraction. Usually the creatinin and the uric acid are also increased above the normal. The non-protein nitrogen increase in the blood is not a direct cause of uremia, for it may exist for a long time without any toxic symptom appearing. Should the patient, however, sustain a trauma or shock, and uremic symptoms will promptly appear.

It is in the dry form of uremia that one finds the greatest retention of all the nitrogenous substances. In the dropsical form there may be no great increase of these substances in the blood, but as the dropsical fluid no doubt contains all of the waste products, the total amount actually retained in the system may be enormous. I have several times seen the development of delirium during the rapid subsidence of an extensive dropsy and have thought it was an effect of the reabsorption of long-stored quantities of waste products.

Another change in the physical chemistry of the blood, and one of great importance, is an increase in the hydrogen-ion concentration, which is tantamount to saying that there is a certain degree of acidosis. The acids responsible for uremic acidosis do not belong, as those of diabetes do, to the volatile fatty acid group, but are of the non-volatile type derived from the metabolism of the proteins.

Anemia is an interesting symptom found in a small number of uremic cases. It may be so striking that it dominates the clinical picture and obscures the underlying nephritis. There is at times very close surface resemblance between uremic nephritis, pernicious anemia, and myxedema.

Another interesting change in the blood, or perhaps in the blood vessels, is one to which I called attention a few years ago—hemorrhagic diathesis, which manifests itself in bleeding from the mouth, the kidneys and the gastrointestinal tract.

One of the most important of the *respiratory manifestations* is paroxysmal dyspnea, usually nocturnal. Equally important, if rarer, is pulmonary edema. Cheyne-Stokes breathing is a very frequent, but perhaps not a very important symptom. I should like to dwell upon the great clinical interest of acute pulmonary edema, but shall postpone that until I speak of treatment.

Gastrointestinal Symptoms. — Uremia produces quite a variety of gastrointestinal disturbances, the most important being vomiting. This in all probability is the result of an effort at elimination through the stomach. It may be so intense that, being associated with obstinate constipation, it causes a suspicion of intestinal obstruction. It is a good rule in cases of persistent vomiting to think of uremia, as well as of the gastric crises of locomotor ataxia. Acidosis should also not be forgotten, nor hysteria nor the toxemia of pregnancy.

Another gastric manifestation worthy of note is hiccough. Only the curious epidemic variety of the last few years can parallel in intensity and duration that of uremia. A rare and distressing symptom is salivation. Another to which Howship Dickinson called attention several years ago is a colitis resembling dysentery.

Urinary Symptoms.—As a rule, the quantity of urine is reduced and albumin and tube casts and blood are present. There are cases, however, often of severe type, in which there is an abundance of urine, of low specific gravity, with but

little albumin. The urine in uremia may indeed be entirely free from albumin as in the case of narcolepsy reported above.

(*d*) *Dermal Manifestations.* — Among skin manifestations one of the most distressing is itching. It is well to bear in mind a possible renal cause in all cases of generalized pruritus. "Dead fingers" is also at times a symptom of renal insufficiency. There is a certain complexion in uremic patients that has a suggestive value to the experienced eye. It has been called the cold buckwheat cake complexion—not a bad name for it.

(*e*) *Mixed Manifestations.*—So many possibilities exist that one can do no more than simply state the fact that various groups of symptoms may combine themselves to produce in a given case the clinical picture of uremia. While a combination of symptoms arising from involvement of various organs is the rule, cases are met with in which but a single symptom is outstanding. This is the so-called monosymptomatic uremia in contradistinction to polysymptomatic uremia. It is the monosymptomatic cases that are especially difficult of diagnosis, the uremic basis being often unsuspected.

An obscure symptom not readily classified under any heading is fever. I have already referred to it in speaking of coma. Sometimes it is due to an evident complication such as bronchopneumonia, pericarditis, cystitis, pyelitis. At other times no infective cause can be found, so that we are forced to assume that the fever is of metabolic origin.

Uremic patients often exhale a peculiar mawkish odor that has something characteristic about it.

DIFFERENTIAL DIAGNOSIS

I want now to speak of the diagnosis of uremia, or rather of the differential diagnosis. Typical cases need not detain us. In obscure cases, especially in monosymptomatic types, we must have some general method of approach that will lead us more or less surely to a correct diagnosis. The following scheme for the study of such cases will, I believe, prove useful:

(1) Urine.—Chemistry, specific gravity, day and night quantity, and the Mosenthal test if the condition of the patient warrants it.

(2) Determination of functional activity of the kidneys by the phenolsulphonethalein test—intramuscularly in dry uremia and intravenously in uremia with dropsy.

(3) Determination of nitrogen and chlorid retention in the blood.

(4) Determination of the carbon dioxid content of the blood and of the alveolar air, and perhaps of the hydrogen-ion concentration, as soon as a good clinical method is available.

(5) Examination of the heart and vessels, including blood pressure; search for pericardial effusion.

(6) Examination of the nervous system.

(7) Examination of all other systems and organs, especially search for effusions, enlargement of the liver, etc.

(8) Examination of the eyes—myosis and changes in the eyegrounds.

(9) Careful study of the temperature.

Some of the foregoing are laboratory investigations and cannot be made by every one, nor can they be made in an emergency. But it is within the power of every practicing physician to test the urine, make a physical examination and to take the blood pressure. If the possibility of uremia as a producer of all manner of symptoms in typical and atypical groupings is borne in mind, the diagnosis can usually be made by the simpler traditional procedures.

My revered teacher, Horatio C. Wood, used to say: "In obscure atypical cases always think of syphilis." I would change this to: "In obscure atypical cases always think of uremia and of syphilis."

DIAGNOSIS OF THE ANATOMIC SUBSTRATUM

To determine the underlying cause is not perhaps very important, because as I have already said, so many variations in the pathological anatomy are possible. Nevertheless, we have to strive for greater knowledge, hence we should undertake by all available means to get a mental picture of the diseased kidney. And yet, from the standpoint of immediate treatment and of prognosis, the most important thing to

know is what reserve functional power the kidney possesses rather than whether the connective tissues or the tubules are the more affected.

It should be remembered that renal insufficiency may be a manifestation secondary and perhaps subsidiary to other conditions. It may then be difficult to tell what share it contributes to the clinical picture. In the course of subacute endocarditis, there comes a time when as the result of frequent bacterial emboli or of toxic degeneration of the kidney, albumin, blood, tube casts and perhaps streptococci appear in the urine. Clearly the kidney is becoming insufficient. But who can tell, in the presence of a terrible blood infection, of bacterial deposits in many organs, what share should be attributed to the kidney?

In ordinary cases of chronic heart disease, whether primarily valvular or primarily myocardial, decompensation and the development of dropsy are associated with the appearance of albumin, tube casts, and at times blood in the urine. Many speak of such cases as cardiorenal, but that does not seem to me to be a correct use of the term. The kidney, no doubt, plays a part in the picture, but so do the liver and the gastrointestinal tract, and it would be just as correct to speak of these cases as cardiohepatic or cardioalimentary as to call them cardiorenal.

Josue has recently described them as false cardiorenal cases, which, though not an attractive term, is better suited to the facts.

The eclampsia of pregnancy is closely related to uremia. There is distinct evidence in this condition of the co-involvement of other organs beside the kidney, for there are usually profound structural changes in the liver, perhaps in the ductless glands and elsewhere.

TREATMENT

I shall not undertake a detailed discussion of the preventive treatment of uremia, for that would involve a consideration of the whole subject of nephritis, which is beyond the scope of this essay. It is, however, within its purview to say that the incidental causes capable of precipitating a uremic attack in a case of nephritis should be guarded against in all possible ways, namely, shock, exposure, acute infections, fatigue, indigestion. Focal infections should also be looked for.

With regard to the actual treatment, there are two measures that are applicable to all forms of uremia—purgation and sweating. For purgation, the mercurials are inadvisable. The salines, the natural laxative waters, cascara and senna are most useful. In some cases, especially when grave symptoms are impending, the best remedy is elaterium.

Sweating can be brought about by a variety of means—the hot pack, the hot bath and the electric cabinet. When the skin fails to respond to treatment, it is well to give pilocarpin, grain 1/12 to 1/8, hypodermically, not, however, when there is dropsy or edema of the lungs. Since sweating raises the concentration of the urea nitrogen in the blood, as shown by Pepper, it is advisable to give plenty of water during the sweating treatment.

If there is evidence of acidosis by the tests at our disposal, or failing these tests, if there is deep labored breathing, very similar to that known as Kussmaul's breathing, the alkalis are indicated and may be given by mouth or by rectum.

A word about the treatment of special symptoms. Uremic headache may respond to sweating and purgation; if not, then the best thing is to leach from the mastoid or temporal region or do a general bloodletting from the elbow. When doing venesection, it is well to apply a blood pressure instrument to one arm and bleed from the other until the systolic pressure sinks to 180.

For uremic vomiting, in addition to the measures mentioned, lavage of the stomach is most valuable. Gastric or sometimes duodenal lavage is also one of the best procedures in the case of uremic hiccough. For convulsions, nothing compares with venesection. A large amount of blood should be taken with due attention to blood pressure. Lumbar puncture is also an excellent procedure for the control of convulsions. If they occur too often, chloroform may be used.

I referred to acute pulmonary edema as one of the manifestations of uremic intoxi-

cation. A striking characteristic of this edema is its tendency to recur, as well as its great gravity. It responds, however, as a rule, remarkably well to the proper treatment. This may be summed up as follows: bleeding, dry cupping, morphin and atropin.

The food in uremic poisoning is primarily governed by the condition of the stomach. If that organ is irritable, buttermilk, ginger ale, malted milk or perhaps vichy water is all that may be tolerated. Later, cereals with sugar, toast, apple sauce, junket and sour milk may be added. As the patient improves, the dietetic treatment merges with the general treatment of the underlying Bright's disease. Usually a reduction in the protein intake is advisable, but it should not fall below 50 grams of protein per day. In certain forms, especially those with marked hydremia, Epstein recommends liberal protein feeding.

While it is desirable in hospital patients to control the food intake by the blood studies, in actual daily practice one must be governed by the general condition of the patient and the quantity and quality of the urine.

I have probably given the impression that uremia makes the life of the doctor difficult by its many masquerades. That is true, but by that very token it adds a great deal of interest to the practice of medicine and also offers a greater field for research than almost any other medical condition.

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THE DIET IN CHRONIC NEPHRITIS*

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The kidney has two chief functions: first, to remove from the body the soluble end-products of metabolism; and, second, by means of a wonderfully effective salt exchange, to maintain in the plasma the unvarying osmotic pressure which is essential to cell life. The dietetic treatment of nephritis, by sparing these two functions, endeavors to lessen the work of the kidney.

There is manifested in our efforts to spare the kidney one all-too-prevalent fallacy. We are accustomed to think only of those nitrogenous end-products which result from food intake and largely to ignore the equally important products of endogenous metabolism. Such considerations are of extreme importance.

To illustrate, take the example of absolute starvation. After the person has burned his reserves of glyogen and "deposit" protein he is forced to live upon his own fats and tissue proteins. If he is the possessor of much fat, his metabolism will be largely at the expense of this and only small amounts of protein will be consumed. At no time, however, even in the presence of an abundant store of fat, does the metabolized protein fall below a certain minimum—an amount which in a man of 70 kilos will yield daily an output of about ten grams of urinary nitrogen. To put it another way, at all times during starvation at least 10 per cent of the total metabolism is at the expense of protein. As his body fat disappears such a man oxidizes more and more of his protein until finally, when all fat has vanished, life is maintained solely at the expense of tissue proteins.

This loss of body protein which occurs in starvation can be prevented if the man is given sufficient food. If this food consists solely of protein, in order to preserve nitrogen balance and prevent tissue loss, there is then required an intake of protein which is at least three and a half times that metabolized during starvation. If, however, carbohydrates and fats adequate to meet the calorific needs are also given, a very small amount of protein will suffice, an amount which is even smaller than that metabolized under the most favorable conditions of starvation.

The protein-sparing quality of such a diet depends largely upon the carbohydrates, but as these are too bulky when eaten in large amount it is necessary, in order to provide sufficient calories, to include a certain amount of fat. To secure maximum protein-sparing qualities it is essential that the diet contain always suf-

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ficient carbohydrates to supply at least half the total energy.

The nature of the protein ingested and its source is not without importance, for nitrogen equilibrium cannot be secured with a protein from which is missing any essential amino-acid. No protein or mixture of proteins can preserve nitrogen balance unless it supplies all of those amino-acids which unite to construct the patient's own tissues. Nor can such equilibrium be economically maintained at a low level of nitrogen intake by means of proteins which are merely poor in any of the requisite amino-acids. If a protein which is poor in any important amino-acid, such for instance as tryptophan, be used as the sole protein food, in order adequately to supply the tissues with this "building stone," this protein must be eaten in excessive amounts, and the surplus of other amino-acids incidentally ingested must be oxidized to form unnecessary waste. From a biological standpoint, such a protein is clearly uneconomical.

This biologic value, so called, of a protein depends upon the completeness with which it furnishes all those amino-acids necessary to the building of body tissues. Casein ranks first in this regard, hence the great value of milk. Meats, particularly the glandular organs such as liver, kidney, and pancreas, and eggs rank next, while the proteins of the cereal grains, tubers, and legume seeds are of distinctly less value. When, as in nephritis, we endeavor to maintain nitrogen equilibrium with the lowest safe nitrogen intake, this biologic value of a protein must receive full consideration.

In selecting the food in chronic nephritis it must be borne in mind that this is a disease not of days or weeks but of years, and that it is necessary to prescribe for the patient an optimum diet which not merely spares the kidney but which will for a long time maintain bodily vigor at the highest possible level.

The amount of protein necessary to accomplish this is still a subject for discussion. We recall Voit's original estimate for the average healthy man of 118 grams of protein daily, which estimate was at that time universally accepted. Then came the well known studies of Chittenden upon himself and a number of students, from which studies it was concluded that unusual mental and physical vigor can be secured with a diet which contains only one-third of the protein advised by Voit, approximately 40 grams daily. Many other students of nutrition, notably Benedict, who at first were opposed to this low protein diet, were led later to accept Chittenden's views.

Now comes McCollum, who points to an important fallacy in the Yale investigator's premises. The students upon whom Chittenden and Benedict made their observations lived upon this low protein diet only about nine months, a length of time which McCollum regards as insufficient to warrant far-reaching deductions. McCollum's criticisms are based upon his experience with mice. A protein intake which is just sufficient in mice to promote growth to maturity at the normal rate will serve for a short time to keep the adult mouse in apparent health and vigor. Upon such a minimal protein intake, however, this animal soon loses his vigor, ages quickly, and dies early. To maintain continued vigor and to experience normal longevity the mouse must receive in his diet a generous supply of good protein, a supply which is materially in excess of his theoretic needs. Since the normal span of life of the mouse is only about thirty-six months while that of man is more than twenty times as long, the fallacy in Chittenden's reasoning seems evident. The assumption that the reaction of an individual to a given diet during a brief fraction of his entire life will furnish a fair index to the way in which he will respond to such a diet during his whole span of life, in the light of animal experiment, seems unwarranted. Therefore, it is reasonable to conclude that in order to enjoy optimal vigor and longevity, in health and disease, man should receive a liberal supply of good protein. By liberal is meant an amount well in excess of that necessary to preserve nitrogen balance, and by good is indicated a protein of high biologic value.

The minimal daily protein intake which clinical experience has shown to be safe for the patient with chronic nephritis is 60 grams. Probably 75 grams is better. It is essential that the protein thus per-

mitted be of good biologic quality, and for this reason the cereal grains and vegetables must not be depended upon as sole sources of nitrogenous food. They must be supplemented by proteins of higher quality such as are found in meats, eggs, and particularly in milk. Thus, to secure to the patient a satisfactory protein intake the diet should always contain a certain amount of milk and a mixture of proteins in which is included at frequent intervals a small amount of meat.

Epstein has called attention to a change in the globulin fraction of the blood which takes place in certain forms of chronic nephritis. He believes that he can remedy this and benefit the patient with a high protein diet. My experience with such a diet is insufficient to warrant a definite opinion, but in a few instances it has seemed to me that such a diet was of value.

Something should be said in passing of the widely prevalent custom of telling a patient with chronic nephritis or indeed with vascular hypertension that he must eat no meats, for much needless harm follows such advice. Another custom which requires comment is that of distinguishing in the diet of this disease between red meats and white meats. As far as it concerns the metabolic end-products which reach the kidney there is not the least difference between red and white meats. On the other hand, the interdiction against broths and meat soups should be emphasized, for these contain meat extracts which are of no calorific value and which throw additional burden upon the kidney.

After an appropriate intake of protein is assured, an abundant supply of carbohydrates should be planned, and there should be added fats sufficient to bring the total value of the diet in a man, say of 70 kilos and sedentary habits, to about 2500 calories. The source of the carbohydrates and fats is of importance. A certain amount of these is secured in the milk, cream, and butter which the patient should always receive. Cereals, bread, potatoes, and preserves are valuable because of their carbohydrates, but these should not be eaten to the exclusion of other carbohydrate foods such as green vegetables, particularly the leafy vegetables. Fats are best taken in the form of cream and butter.

No discussion of diet is complete without mention of the importance to the human economy of a generous supply of vitamins. The patient who secures his carbohydrates from the cereal grains, tubers, and legume seeds, and his proteins from muscle meats is apt to have superimposed upon his nephritis some of those vague disorders which result from chronic vitamin deficiency. If, as advised above, he will include in his diet sufficient quantities of milk, fruits and the leafy portion of vegetables, and as sources of protein will perhaps eat a certain amount of the often despised liver, kidney, or sweet breads, he will escape the ills of vitamin deficiency.

Since one function of the kidney is to regulate sale exchange, and since the ability of the sick kidney to excrete certain inorganic salts is at times impaired, the diet should be arranged with some thought as to its mineral content. Attention has been repeatedly called to the failure of the average American diet to supply a sufficient amount of calcium, and since this element is an important component of certain body tissues, this is a serious fault. Milk, again, because of its richness in calcium, is of value in making up this deficiency.

In a disease one feature of which is the abnormal production of acid, consideration could with advantage be given to the acid or base forming properties of the patient's food. Among the vegetables the base-forming ash of the potato is of preeminent value. It is said that apples, raisins, and bananas in this regard are likewise useful.

Chlorid intake has been the subject of much discussion. Recently it has been suggested that chlorid restriction as ordinarily practiced is not sufficiently rigid. However, from certain experimental observations which I recently published, it was concluded that the almost total elimination of chlorids from the food accomplishes nothing more than does the less rigid restriction at present in vogue. I

understand that others who have studied the influence of chlorid restriction in nephritis have reached similar conclusions. The restriction of salt is adequate when the patient is told to eat unsalted butter, to add no salt to his food after it reaches the table, and to eat no unusually salty food such as bacon. Thus he will receive the equivalent of about two grams of NaCl daily, an amount which we believe the kidney can easily excrete.

The pendulum of opinion concerning the drinking of water in chronic nephritis has swung back to the midline. The drinking of a reasonable amount of water does not raise blood pressure or harm the kidney; nor conversely has it been shown that good has ever been accomplished by the old practice of drinking enormous quantities of water. Therefore, it seems best to advise a moderate fluid intake of about three to five pints daily, the amount depending somewhat upon the climate and the resulting loss of fluid through the skin.

To secure maximum nutritive efficiency the digestive organs should be protected against abuse. The food should be simple. Pies and other pastries, fried food, all complex, highly seasoned "made dishes," should be interdicted. It is advisable that constipation be prevented and for this reason the diet should include always a sufficient amount of honey, fruits, vegetables, bran and other laxative foods.

Lastly, concerning the practical arrangement of the diet, the patient with chronic nephritis, as with diabetes, should be educated in the rudiments of the science of nutrition. He should be told the aims of dietary regulation and should receive elementary instruction in the chemical nature and the biologic properties of the various foodstuffs. Methods of computing food values should be taught the patient and with the aid of some book on the subject such as that written by Locke, he should learn to arrange his own diet. He should receive general instruction and specific rules rather than specific daily diet lists.

THE RELATION OF ACIDOSIS TO NITROGEN RETENTION IN EXPERIMENTAL NEPHRITIS*†

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The association of a reduction of the titratable alkalinity of the blood with certain forms of kidney disease has been recognized for the past thirty years. Not a few investigators have assumed that this reduction of the blood's alkalinity was responsible for the injury to the kidney. Basing his conclusions on most careful experiments, MacNider has particularly emphasized the occurrence of acidosis in dogs poisoned by uranium nitrate or by mercuric chlorid, and has observed that the administration of alkali in amounts sufficient to keep the reserve of the blood at its normal level seems to lessen the damage to the kidney as seen microscopically. Other investigators have attempted to explain the intoxication by methyl alcohol chiefly on the basis of the acidosis which may follow toxic doses of this alcohol. Reference to the modern literature dealing with the treatment of clinical cases of poisoning by both mercuric chlorid and methyl alcohol shows that many physicians advocate "alkalinization" as a procedure of much importance.

Previous experiments of one of us upon dogs poisoned by methyl alcohol showed that while a reduction in the alkali reserve of the blood frequently occurred, yet the degree of acidosis and the severity of the intoxication did not always vary in the same direction. In certain instances of severe or even fatal poisoning, the alkali reserve was found to remain at a high normal level to within a very short time before the death of the animal. In other cases, a marked reduction in the alkali reserve was unaccompanied by evidence of severe intoxication and the animal subsequently recovered. Furthermore, our re-

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sults from alkali therapy in dogs poisoned by methyl alcohol were such as to lead us to doubt not only the efficacy of this therapeutic measure, but also to question the belief that a reduction of the alkali reserve actually determines the severity of the intoxication.

In our experiments with mercuric chlorid, we have found that if a dose sufficient to kill an untreated dog be injected subcutaneously it is often possible to save the animal by the intravenous and subcutaneous injection of isotonic salt solution. In our hands, the addition of bicarbonate of soda to such solutions appears to possess no advantage. Indeed, the animals that have received such alkaline solutions have shown a higher mortality rate than those receiving the plain saline.

Recognizing the fact that acidosis does occur in mercuric chlorid poisoning, with structural changes in the kidneys, the question arises: is the reduction in the alkali reserve the cause of the damage to the kidney, or is it, along with the nephritis, the result of a common cause? Burmeister and McNally have shown that massive doses of mercuric chlorid given orally may produce structural changes in the kidney within three minutes. We have been able to show that there occurs no appreciable reduction in the alkali reserve of the plasma after almost an hour subsequent to the intravenous injection of a fatal dose of mercuric chlorid. Furthermore, in dogs that have received large doses of mercuric chlorid intravenously, the reduction in the alkali reserve is much less striking than the coincident increase in the nitrogen of the blood. This relationship is clear from the figures given in Table I.

TABLE I.

Relationship Between Alkali Reserve, Urea Nitrogen and Total Non-Protein Nitrogen of the Blood in Dogs Poisoned by Mercuric Chlorid.

Dog. No.	CO_2 Cmbg. Power of Plasma in Vols. per cent	Urea N. in Mg. per 100 c. c. Blood	Total N. P. Nit. in Mg. per 100 c. c. Blood
3—Normal state	64.3	15.0	27.3
24 hours later	59.7	40.5	63.3
48 hours later	56.9	90.0	103.3
72 hours later	51.4	120.0	153.0
96 hours later	52.2	150.0	189.0
120 hours later	46.7	225.0	265.5
4—Normal state	64.3	9.0	26.1
24 hours later	61.6	14.5	25.0
48 hours later	56.9	49.5	88.2
72 hours later	46.7	124.5	199.5

Results very similar to those tabulated have been obtained in six other dogs, but are not given, since they show nothing more than appears in the above table. It is apparent from these figures that, although there is a reduction of the alkali reserve, it is relatively insignificant in comparison with the increase in the nonprotein nitrogen of the blood. It is well recognized that considerable damage to renal structure may be present without leading to appreciable retention of the nitrogen in the blood. In other words, the increase in the blood nitrogen occurs relatively late, some time after the initial anatomical changes in the kidney. Therefore, from the results that have been presented in Table I, we should have to conclude that a very slight decline from the average alkalinity of the blood suffices very rapidly to cause histological alterations in the cells of the kidney if we would adhere to the view that the acidosis is responsible for the renal changes.

In the case of one dog poisoned by the intravenous injection of three and a half milligrams of mercuric chlorid per kilogram intravenously, results have been obtained which would seem to indicate that decreased functional power of the kidney occurred before there was any reduction of the reserve alkali of the blood. The changes which occurred in this animal's blood are shown in Table II.

TABLE II.

Impairment of Renal Function Without Acidosis in Mercury Poisoning.

Dog No.	CO_2 Cmbg. Power of Plasma in Vols. per cent	Urea N. in Mg. per 100 c. c. Blood	Total N. P. Nit. in Mg. per 100 c. c. Blood
1—Normal state	61.6	13.5	29.4
24 hours later	64.3	30.0	63.0
48 hours later	60.6	106.5	148.5
72 hours later	54.1	150.0	177.0
96 hours later	54.1	166.0	193.5
120 hours later	47.5	176.2	240.0*

The normal carbon dioxid combining power of the plasma of this dog was 61.6 volumes per cent. Twenty-four hours after the injection of the mercury it had risen to 64.3 volumes per cent, and, despite this, the nitrogen of the blood showed a definite increase. In this case, therefore, we are forced to the conclusion that renal injury occurred before a reduction of the reserve alkali of the blood; or, else, there was a temporary reduction and a subsequent temporary rise of the alkalinity of the blood. That such an occurrence is not impossible may be seen in the case of Dog 3, in Table I; the alkali reserve being higher 96 hours after the mercury administration than it was at the end of 72 hours, to fall much lower in 24 hours more.

The results of alkali therapy in dogs poisoned by the subcutaneous injection of mercuric chlorid have been disappointing, so far as enabling us to prevent a fatal outcome. In a few cases we have studied the influence that alkali administration may have on the blood changes which follow the intravenous injection of large doses of mercuric chlorid into dogs. Similar experiments have been performed by Goto, alkali administration being tried in various forms of experimental nephritis without very definite influence being exerted on the nitrogen retention.

In our experiments designed to show the effect of alkali administration on the blood changes following intravenously injected mercuric chlorid, two animals were used: one (Dog 18) received a dose of 3.5 mg. of the salt per kilogram, and the other (Dog 16), 4 mg. per kilogram. The first animal recovered and the second succumbed on the third day. Precisely similar changes occurred in these animals as did in the controls, so far as the nitrogen retention was concerned, in spite of the fact that the alkali reserve was kept at a persistently high level. The results of the analyses are given in Table III.

In the animals which we have used, spontaneous recovery has followed the injection of the dose of 3.5 mg. of the mercuric chlorid in a number of instances, while all untreated animals have succumbed to the dose of 4 mg. per kilogram.

TABLE III.

Influence of Alkali Administration on Blood Changes in Dogs Poisoned by Intravenous Injection of Mercuric Chlorid.

Dog No.	CO_2 Cmbg. Power of Plasma in Vols. per cent	Urea N. in Mg. per 100 c. c. Blood	Total N. P. Nit. in Mg. per 100 c. c. Blood
18—Normal state	68.0	12.6	24.9
After $NaHCO_3$* $HgCl_2$ injected	81.5	.....	.....
At end of 24 hours	80.6	60.0	78.0
At end of 48 hours	57.0	107.0	130.0
$NaHCO_3$ injected	68.0	.....	.....
At end of 72 hours $NaHCO_3$ injected	74.9	105.0	136.0
16—Normal state	53.2	14.4	27.0
After $NaHCO_3$ $HgCl_2$ injected	125.2	.....	.....
At end of 24 hours $NaHCO_3$ injected	81.5	46.2	74.1
At end of 48 hours $NaHCO_3$ injected	93.2	90.0	166.0

*In each instance 5 c. c. of 10 per cent sodium bicarbonate per kilogram of body weight.

It would seem fair to assume that, if the reduction of the alkali reserve that occurs in mercury poisoning is actually the cause of the depressed renal function, a similar reduction of the reserve by other means would have a similar effect. In order to determine this, two dogs were placed in metabolism cages and deprived of all food for twenty-four hours. In the case of one of the animals this sufficed to reduce the CO_2 combining power of the plasma from an initial level of 51.3 volumes per cent to 48 volumes per cent; while the blood nitrogen showed no increase. The alkali reserve of the second dog showed no change as a result of the fast. Both animals were then given 1 c. c. of dilute hydrochloric acid per kilogram orally, with the result that the dog that had previously showed no decrease in the reserve alkali now showed a diminution to 46 volumes per cent, the initial reading having indicated a combining power of 49.4 volumes per cent. Here also there was no increase in the total non-protein nitrogen nor in the urea nitrogen of the blood.

These results that we have already obtained appear to indicate quite clearly that the "acidosis" is certainly not responsible for the severity of the intoxication by

methyl alcohol or by mercuric chlorid in some cases, at least. Not only is the reduction of the reserve alkali relatively slight in the beginning, but evidence of renal damage may be obtained before there is any decrease in the alkali reserve at all. Furthermore, when the reserve alkali is kept at a high level by the intravenous injection of sodium bicarbonate, little effect seems to be exerted on the course of the poisoning and the impairment of renal function. Finally, a reduction of the alkali reserve through starvation and administration of dilute hydrochloric acid, though fully as great as that seen early in the course of poisoning by mercuric chlorid does not lead to a retention of nitrogen which is seen in this latter condition.

We are convinced not only that sodium bicarbonate therapy is useless in certain cases of mercuric chlorid poisoning, but unless great care is exercised in its intravenous injection serious damage or even death may ensue. In the paper previously referred to it was shown that the intravenous injection of solutions of bicarbonate of soda into dogs in doses quite comparable to those occasionally recommended for clinical use may give rise to convulsive seizures and immediate or delayed death. Similar occurrences have been noted following the clinical employment of intravenous bicarbonate therapy, so it should be realized that this form of therapy is by no means devoid of danger. We feel that it cannot be too strongly stressed that alkali administration in supposed cases of acidosis should be resorted to only when it has been definitely shown that there is a reduction of the reserve alkali of the plasma and, even then, oral or rectal administration should be preferred to the injection of the solution intravenously.

DISCUSSION

Papers of Dr. Riesman, Dr. McLester and Drs. VanderHoof and Haskell.

Dr. Louis Hamman, Baltimore, Md.—Some progress has been made toward the solution of this riddle during the past ten or fifteen years. This progress consists in our now being able to state the riddle somewhat more precisely and more clearly. Uremia originally meant intoxication due to a piling up of urea in the blood. We now know that retention of urea is not the cause of the symptoms of uremia, but the time-honored term is retained and used to imply an intoxication due to substances retained in the blood consequent to seriously impaired renal function. Uremia, therefore, is the term used to designate a group of intoxication symptoms associated with renal insufficiency. This seems clear enough and yet in practice the greatest confusion has arisen by including under uremia a whole host of symptoms that bear no direct relation to renal insufficiency. Almost every symptom a patient with nephritis may have has been termed uremic. It is important to emphasize that there is a characteristic group of symptoms which should bear the name uremia, and also that there is a large group of accessory or associated symptoms which also occur commonly in the absence of renal insufficiency and therefore are not uremic.

The classical symptoms of uremia are lethargy, gradually progressing to coma, increased reflexes and muscular twitchings, stertorous breathing and often hyperpnea, anorexia and vomiting, a urinous odor to the breath, headache and a rise of blood pressure and a tendency to certain infections, chiefly stomatitis, enteritis and pericarditis. Symptoms often associated with uremia but which occur still more frequently in the absence of renal insufficiency and are not necessarily due to intoxication are convulsions, transient cerebral symptoms such as aphasia, hemiplegia, hemianopsia, etc., psychic disturbances such as mania, hallucinations, etc., paroxysmal dyspnea, pulmonary edema, Cheyne-Stokes breathing and many others.

While genuine uremic symptoms are due, we believe, to retention intoxication, the latter or pseudo-uremic group are associated particularly with vascular changes. They occur with greatest frequency in association with hypertension and arteriosclerosis and are often preceded by marked rise of blood pressure, so-called blood pressure crises. I cannot stop to discuss the mechanism of production of these symptoms other than to say that many of the cerebral symptoms, especially the acute eclamptic convulsions, are no doubt due to edema. An analogue are the attacks of suffocating pulmonary edema which come on with singular abruptness and disappear as rapidly as they come. Some of the transient symptoms may be due to angiospasm. It is perhaps important to emphasize again that convulsions are uncommon in uremia and that acute eclamptic convulsions are not uremic manifestations. Dr. Riesman has commented upon the difficulty of distinguishing between the cerebral symptoms due to temporary circulatory disturbance and those due to hemorrhage or thrombosis. There is no sure way to distinguish them, and transient attacks often precede the occurrence of hemorrhage or thrombosis. However, if the distinctions I have indicated are borne in mind, there is seldom difficulty in distinguishing between cerebral vascular accidents and uremia.

Such a division of symptoms clarifies the problem and makes an investigation of uremia simpler. We are not justified in speaking of uremia unless modern methods of blood analysis reveal definite nitrogen retention. If the manifestations of renal disease are studied by modern methods, then we shall soon have a more concrete definition of ure-

mia shorn of the host of associated symptoms in no way characteristic of uremia.

Dr. Elsworth S. Smith, St. Louis, Mo.—At our clinic in the Washington University Medical School we have studied two groups of cases of arterial hypertension with nephritis, one hospital, the other ambulatory, and these were then further divided into those which did not and those which did show renal insufficiency. Our results are as follows:

Group 1.—Twenty-five compensated hospital cases studied for three weeks, when put on a regime of rest, diet and elimination, presented a steady declining blood pressure curve from 205 to 140 systolic and 110 to 90 diastolic without the slightest disturbances in renal compensation.

Group 2.—A group of 30 hospital cases, also studied three weeks, and which showed different grades of renal insufficiency, when placed on the same regime, likewise presented a steadily declining blood pressure curve. These showed not only no increase in the renal decompensation, but an actual improvement, as evinced by a diminution in quantity of albumin and number of casts with a rise in the phenosulphophthalein kidney function test and a lowering of the non-protein blood nitrogen.

Group 3.—There was a compensated ambulatory group which, when submitted to the same regime, gave the same results as seen in Group 1, representing the hospital cases.

Group 4.—This was a group of decompensated ambulatory cases showing on submission to the same regime as the other groups results identical to those seen in Group 2 of the hospital cases.

The pressure curves in all these groups were based on the average daily blood pressure in each group of cases.

While it may be contended, therefore, by some, that arterial hypertension is compensatory and conservative in nephritis and that any lowering of the blood pressure will increase renal insufficiency, still it seems to us from our study that lowering of blood pressure does not cause or increase renal decompensation, but rather improves the decompensated kidney because it improves the circulation through helping the laboring heart. The point I wish to bring out especially in Dr. Riesman's paper is that nephritis is not always the cause of hypertension, and therefore that hypertension is not necessarily of renal origin in all cases. It may be the actual cause of nephritis in a rather large proportion of these cases through production of arteriosclerosis of renal arteries and consequent arteriosclerotic nephritis.

Dr. W. H. Olmsted, St. Louis, Mo.—If uremia is the result of decompensation of the kidney, we should have in the blood evidences of that decompensation; in other words, an accumulation of urea. The blood non-protein nitrogen is the easiest procedure to show that. It is not very difficult to do and is of great help in differentiating from true uremia those symptoms that are often confused, as Dr. Hamman says, with it. Unless there is retention of nitrogen in the blood stream, we cannot frankly call it uremia, but retention of nitrogen in the blood is often seen without the symptoms of uremia.

We have carried out in the past two years about 800 determinations of blood non-protein nitrogen. I was interested to see what became of the cases which showed a frank retention of urea. In these determinations about one hundred patients showed non-protein nitrogen which represented a frank retention. I divided them into three general groups: the first group, chronic nephritis; the second group, heart decompensation, as shown by functional tests, which was of more importance than kidney disease; and the third group, that in which there were infectious processes in the kidney.

Of the nephritics, 63 per cent died in the hospital and only 9 per cent showed a return of the non-protein nitrogen to the normal level. Of the cardiac cases, 50 per cent showed a return to normal level and 50 per cent died. In other words, the kidney is not the deciding factor in such cases. The third group, infectious kidney disease, showed a return to normal level of the non-protein nitrogen in 50 per cent of the cases and 50 per cent completely recovered. In other words, the interpretation of nitrogen retention depends on what process is back of the retention. This is a rather important point.

Another thing of great value is the determination of the cardiac factor. In a case where we have symptoms of so-called "wet" uremia showing non-protein nitrogen between 40 and 50, one can be sure that the main factor is the heart and not the kidney. That is an important index for treatment, because in such cases treatment should be directed toward the heart rather than toward the kidney. Especially is this true in deciding the question of the proper amount of water to give the patient. When the heart is mainly involved, harm is done by forcing water, whereas with kidney disease one gives the kidney enough water so that it will perform its function properly.

Dr. Frank A. Jones, Memphis, Tenn.—From recent studies of blood chemistry and kidney function, the question of diet in any form of Bright's disease is as much of a riddle as is uremia in nephritis.

Two of our foremost men (Mosenthal and Epstein) have reversed themselves in the matter of diet. In other words, they have convicted themselves with reference to their previous views. It is not so long ago that Alexander Haig wrote on this subject, so that we do not know really where we are in the matter of diet in any form of Bright's disease.

As to whether we will confine ourselves to certain stipulated conceptions as to what we shall give in the way of foods in the different forms of Bright's disease depends upon blood chemistry and kidney function, and what our psychological attitude toward the whole question is. It might be well if in this review of the question we mingle the old with the new, and be not the last to give up the old and not the first to take up the new.

The question of diet in nephritis today is as much overdone as was starvation in diabetes or the question of not giving anything in typhoid fever twenty-five years ago.

Of course any combination of these subdivisions is possible.

Having cleared the field thus far, let us proceed with a brief discussion of the three main groups mentioned, paying especial attention to the first and last.

THE ATROPHY GROUP

The first thing that we should realize is that the atrophies of this group are always organic and due to definite lesions, and the second is that these lesions always affect some part of the lower motor neuron, i. e., the neuron from and including the anterior horn cell in the gray matter of the cord ending in its peripheral nerve distribution in the muscle fibre. Atrophy, except the so-called atrophy of disuse, does not occur when the lesion is in the upper motor neuron alone, i. e., the neuron from and including the cerebral cortical cell to, but not including, the anterior horn cell. In other words, when the upper motor neuron is affected and atrophy occurs, as in amyotrophic lateral sclerosis, the lower motor neuron must, either primarily or as a complication, also be affected. True progressive atrophy, as shown by Dana, may occur in cases of locomotor ataxia, but, when this is so the anterior columns are affected by pathological changes affecting the lower motor neuron in addition to the changes in the posterior columns.

In my opinion, with the exception of four rare hereditary forms of progressive muscular atrophy, the Werding-Hoffman infantile form, the Dana adult form, the Charcot-Marie-Tooth peroneal type and the Dejerine-Sottas interstitial neuritic type, which seem to have a definite familial relation, all progressive muscular atrophies are due to streptococci (rheumatoid), spirochetes (luetic) or other infection, or to lead or other poisons unless, indeed, in rare instances trauma may be a causative factor. Not for an instant do I believe that such causes as mental strain, over-use of certain muscles, or exposure, mentioned in many text books, have anything to do with the etiology of progressive muscular atrophy. The rare hereditary cases may be explained by defective lower motor neuron development.

To this true atrophy group belong certain distinguishing features that do not accord with either the dystrophy-myopathy or the pseudo-atrophy group. These features are the presence of fibrillary twitchings, motor neuron changes, early decreased response to both Galvanism and Faradism followed later by partial or complete reaction of degeneration and complicating bulbar palsy. When, in addition, the case shows progressive atrophy and weakness, no pseudo-hypertrophy, myotatic irritability, lack of objective sensory change and wasting of the thenar and hypothenar and other hand muscles, there is little difficulty of diagnosis. True progressive atrophy never begins generally, but usually in the hands or hand or some other special muscle groups. Only in the very late stages does the wasting seem general. For a description of the various types of this group one is referred to the text books.

In considering the treatment we should look for focal infection, syphilis, lead or other metallic poison. If no causative factor can be discovered the treatment becomes entirely supportive and symptomatic.

THE DYSTROPHY-MYOPATHY GROUP

When considering this group, whether marked by either muscular wasting or pseudo-hypertrophy, it should be remembered that the conditions are congenital, no matter at what age the symptoms first appear. However, in distinction from atrophy, the patients are usually younger; also, with the exception of rare forms of hereditary atrophy already mentioned, progressive muscular atrophy has no familial relation while dystrophy-myopathy conditions do. The group under consideration affects the large muscles, the hands usually escaping, while the hands are frequently first affected in progressive muscular atrophy. In dystrophy-myopathy, unlike atrophy, pseudo-muscular hypertrophy and rarefaction of the long bones may take place. Sensory changes and fibrillary twitchings do not occur in dystrophy-myopathy cases and neither does reaction of degeneration, although a general lessening of electrical excitability is present.

The etiology of dystrophy-myopathy cases is unknown and therefore the treatment is simply supportive.

THE PSEUDO-ATROPHY GROUP

(*a*) *Those in which muscle wasting is due to malnutrition.*

Some eight years ago a young man was brought into my office the picture of a walking skeleton. He had been diagnosed as having progressive muscular atrophy. He had no fibrillary twitching, no myotatic irritability, and no reaction of degeneration. The wasting was general, there was no familial relationship, no motor neuron change, and no bulbar symptoms. The patient had a gastritis. Appropriate diet and massage made him a normal man in a few months.

This case illustrates extreme emaciation with preserved ability to walk about. The point is that malnutrition cases only resemble true atrophy and the moral is, the diagnosis of progressive muscular atrophy should never be made upon resemblances only.

(*b*) *Those in which pseudo-atrophy is due to hysterical paralysis.* Hysteria may present either general muscle wasting, in which malnutrition and malassimilation play a large part, or local pseudo-atrophy connected with hysterical paralysis, in which the chief role is played by disuse. Like other hysterical manifestations, this condition may resemble true atrophy, but never exactly similates it. The signs of organic disease are absent and other symptoms of hysteria are usually present. It is more common in one extremity and rarely assumes the shoulder or pelvic girdle type, or the peroneal type. Fibrillary twitchings and reaction of degeneration are absent. In spite of these facts it has been mistaken for organic progressive atrophy. Treatment directed toward the psycho-neurosis combined with massage and Faradism over the affected parts usually cures the condition.

(*c*) *Those in which pseudo-atrophy follows disease.* Arthritis is frequently followed by local atrophy. It is always well to examine carefully the joints in the neighborhood in any case of atrophy. Muscle wasting of this type may follow fracture and is seen at times in hemiplegic limbs, even out of proportion to the paralysis. I had a case of muscular wasting following typhoid fever which affected the shoulder girdle more than the muscles elsewhere. This wasting was greatly benefited by massage and proper nourishment. Mineral poisons may at times give a pseudo-atrophy without organic signs. I recall a very marked lead case, which, upon salicylates, iodids and massage, entirely recovered; and another, in a patient in whom the legs were chiefly affected, in which the patient gained forty-one pounds in a few months. In the first case lead was not at first suspected, but later was discovered in the blood and urine. The patient had absorbed the lead while pregnant by painting with lead paint. The offspring was apparently not affected. The second case had neuritic symptoms in the legs, which made it a mixed organic and non-organic type, and the source of the lead, after diligent inquiry, was found to be subacetate of lead pills which she had taken for over a year because she thought "they were doing me good." Treatment in this group is directed toward the cause as well as the wasting and is not infrequently efficacious.

(*d*) *Those cases in which pseudo-atrophy and myopathy-dystrophy are due to endocrine disturbance.* Many suggestions have been made relating to atrophies, myopathies and dystrophies and their connection with endocrine disturbance. Brock and Kay[1] reported one case of muscular increase and two cases of myotonia congenita thought to be due to polyglandular disturbance. Timme[2] stresses the importance of pineal disorder in progressive muscular dystrophy and also disorder of the pituitary, thyroid and ovaries. The writer fed two cases of pseudo-muscular hypertrophy upon thymus gland extract with some improvement. Gonads and certain castrates often have very considerable muscle wasting, especially marked, it seems to me, around the pelvis. This wasting may improve, especially in young patients, on the administration of the indicated endocrine extract. Hyperthyroidism is, at times, accompanied by marked muscle wasting which improves when the thyroid is adequately treated or operated upon.

Upon the whole, however, not enough work upon the relationship of endocrinology with atrophies and myopathy-dystrophies has been done to draw definite deductions.

In conclusion, I desire to state that I have attempted to simplify the whole

You must mix experience and judgment with theory and art with science. In addition to the theory about treatment for Bright's disease we should use two textbooks: Swedenborg on "Rational Psychology" and Lord Bacon's "Inductive Philosophy." And then we should read the thirteenth chapter of Corinthians on faith, hope and charity.

Dr. Stewart R. Roberts, Atlanta, Ga.—I want to give vent to a few clinical impressions on Dr. Riesman's paper. He called attention to rapid respiration in those individuals who have signs of cardiovascular renal disease. I remember one case Dr. Paullin and I together saw in a gentleman with arteriosclerosis and mild hypertension in whom a rapid respiration was the first objective clinical sign of an oncoming uremia. It is a symptom that is rare, but one we may well take note of—rapid respiration without apparent objective cause in one with vascular involvement.

Another very interesting clinical phenomenon in uremia is the unilateral convulsion. Of course, we are all aware that unilateral choreas do occur, unilateral tetanies, and unilateral myoclonic conditions, such as convulsive tic, and unilateral convulsions in tetany, while also rare, are of great clinical interest.

I have not seen in my own individual experience a patient with uremia with the neuromuscular or twitching form who ever got up out of his bed or away from his room. In my experience twitchings of the muscles are universally of serious prognostic import and tend to early death.

I would like to accentuate one custom in the South that is followed too freely and apparently without clinical consideration, namely, giving large doses of calomel in uremia. We probably with due respect to ourselves in the Southern states have the calomel habit, and large doses of calomel in any form of uremia, even of the mild type, are severely contraindicated. A saline is so much better. Furthermore, we tend to give too much calomel in the so-called bilious states, whatever they are. And those attacks called biliousness by the patient, if accompanied by periodical attacks of nausea, and more particularly if in that patient there is early morning headache associated with chronic hypertension, may be but a symptom of periodic uremic states.

I would like also to accentuate a point Dr. McLester made, and I do want to agree generically with Dr. Jones that we are probably in the twilight zone relative to the clinical application of dietary problems of nephritis and the uremic states. I agree with Dr. McLester that it is well to avoid the old English use of broths and meat soups in nephritis and uremic states. There is just as much nourishment and as much poison in an equal amount of urine.

I want to call attention lastly to a point that Dr. Riesman made relative to the value of lumbar puncture in the transient hemiplegias of uremia. While one in his clinical lifetime has but a moderate experience with this procedure, I have been impressed with the possible diagnostic value of an acute rise in blood pressure in one who already had had hypertension in these so-called transient hemiplegias, and the rapidity with which the blood pressure drops after a lumbar puncture. One might do a lumbar puncture in such a state without fear and without danger and without pain to the patient. I have also had the impression, although unable to prove it, in these transient hemiplegias and monoplegias where there is a sudden rise of blood pressure, particularly the systolic pressure, that it is usually greater than in the true cerebral hemorrhage; or to put it differently, in the hemiplegia due to an actual apoplexy. It would take time to prove this point, but I am certainly convinced of the ease and the value of lumbar puncture in the transient hemiplegias of uremia.

Dr. W. McKim Marriott, St. Louis, Mo.—In the consideration of nephritis and uremia in the past we paid too much attention to the kidney and too often lost sight of the fact that the clinical condition referred to as "nephritis" is in reality a general disease, of which the kidney is only one of the organs effected. We now know that certain substances usually classed as kidney poisons exert their effects to almost the same degree in animals from whom the kidneys have been removed as in normal animals. The work of Wallace in New York has clearly demonstrated this fact. We know, furthermore, that complete removal of the kidneys does not lead to all the characteristic symptoms of nephritis.

In that form of nephritis referred to as the "wet" or "dropsical" type changes have taken place in many of the cells and fluids of the body. There is a change in the surface tension of the fluids and a change in the permeability of the cells. These changes affect the cells of the renal parenchyma, especially the tubules in a similar way with other cells of the body. These patients are not edematous because the kidney fails to excrete water. They are edematous because the tissues hold the water and consequently there is very little for the kidney to excrete. This form of nephritis is brought about by cellular poisons among which are certain bacterial toxins. The successful treatment of the condition is dependent upon preventing these poisons from entering the body. If this can be done the condition will clear up and unless it has lasted too long there will be no permanent damage to the kidney or other portions of the body. It has been our experience with this type of nephritis in childhod that many of the patients are suffering from infection of the nasal accessory sinuses. In a fairly large series we have observed disappearance of the edema and the excretion of a normal urine following the clearing up of these sinus infections. This we have repeatedly seen occur even when no changes whatsoever were made in the diet. In fact, the dietary treatment of this form of nephritis, ordinarily referred to as the acute parenchymatous type, is very unsuccessful. The nasal accessory sinuses are only one of the places in which the source of infection may be found. It is a very frequent source in childhood.

In the interstitial type of nephritis a true inflammatory condition of the kidney with fibrosis has occurred. The damage here is irreparable and treatment can be only palliative.

I would like to say a word in reference to Dr. VanderHoof's paper regarding the acidosis of ne-

phritis. The type of nephritis in which acidosis occurs is a more serious type than that we have been discussing. There is here a definite failure to excrete various substances among which is acid phosphate. It is only late in the disease that retention of phosphate occurs, and hence the appearance of acidosis is of grave prognostic import, as it is an indication of an extreme degree of renal insufficiency. The patients do not usually die from the acidosis. The administration of alkalis will correct the slight degree of acidosis, but does not hasten the patient's recovery. The retention of acid phosphate not only leads to acidosis, but also brings about a diminution in the calcium content of the blood. Administration of alkalis to such patients still further lowers the blood calcium and this not infrequently leads to symptoms of tetany and a tendency to hemorrhages. The tetany results in convulsions. For these reasons alkalis are contraindicated in the acidosis of nephritis. The administration of calcium salts is of some benefit, as this tends to restore the blood calcium and to remove from the body the excess of retained phosphate.

Dr. McLester (closing).—I think we all recognize that we do not know everything about diet in nephritis or in other diseases, but I am not prepared to admit, as has been suggested today, that the picture is hopeless. It occurs to me that things sometimes look dark and uncertain to the individual whose vision is cloudy, or who for other reasons cannot see well.

ATROPHIC CONDITIONS CONTRASTED WITH MUSCULAR WASTING FROM EMACIATION*

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Probably the least understood diseases in the whole realm of medicine are the atrophies, dystrophies, myopathies and certain of the nutritional muscular disturbances. It is not within the province of this paper to consider adequately the various forms of these conditions or, in fact, to give a detailed description of any form or forms. My intention, based upon a review of the literature and clinical experience, is to attempt a simplification of the classification and gain a clear understanding of these conditions, the very nomenclature of which, whether bearing the personal names of early investigators, or anatomical or other designations, is, to say the least, awe-inspiring.

The most direct method of approaching the problem is to group and define the conditions under consideration.

(1) *The Atrophy Group.*—This group is marked by progressive muscular wasting, with motor weakness due to degeneration in the anterior horns of the spinal cord, followed by degeneration of the motor nerve roots and nerves to the muscles. Usually the spinal degeneration ascends the cord to the medulla giving the syndrome known as bulbar palsy. To this group belong progressive muscular (spinal) atrophy, the hereditary types of spinal and neuro-spinal atrophies, glosso-labio-laryngeal paralysis and amyotrophic lateral sclerosis. These diseases bear various other names, but the ones selected here appear to be the most descriptive.

(2) *The Dystrophy-Myopathy Group.*—Sir James Purves Stewart does not distinguish between dystrophy and myopathy, which greatly aids us in attempting a simpler classification. There is no reason to distinguish between the two. Dorland's "Medical Dictionary" gives the definition of dystrophy as a progressive atrophy of muscles with no discoverable lesion of the spinal cord, and of myopathy as any disease of a muscle. These are certainly indistinguishable because in both the disease is of the muscle fibres themselves. The myopathies and dystrophies embrace both those cases in which there is only muscle wasting and those in which pseudo-hypertrophic changes take place. To the class marked by wasting belong the juvenile shoulder girdle and upper arms type of Erb, the facio-scapulo-humeral type (Landouzy and Dejerine), where the wasting begins in the face, and a type which affects mainly the anterior thigh muscles. To the pseudo-hypertrophy class belongs the condition known as pseudo-muscular hypertrophy.

(3) *The Pseudo-Atrophy Group.*—This group is subject to four subdivisions: (a) those in which muscle wasting is due to malnutrition; (b) those in which it is due to hysterical paralysis; (c) those in which it is due to disease; and (d) those in which it is due to endocrine conditions.

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subject of muscle wasting, both organic and non-organic, in order that our approach may be less awe-stricken and our conception less confused. If I have only partly succeeded I shall be gratified.

REFERENCES

1. Brock and Kay: Archives of Internal Medicine, January, 1921, Vol. xxvii, pp. 1-37.
2. Timme: Archives of Internal Medicine, January, 1917, Vol. xix, p. 79.

DISCUSSION

Dr. C. E. Dowman, Atlanta, Ga.—From the standpoint of diagnosis, surgical neurologists are frequently confronted with the proposition of differentiating between the various types of atrophy, particularly the atrophies that are the result of trauma. Any attempt to classify atrophies is laudable because, when we review the literature, we are confronted with a multiplicity of names based, as a rule, upon the anatomical part involved, which leads to much confusion. The principal point of importance brought out by Dr. Tucker is the differentiation between an organic atrophy and the atrophy of disuse beautifully illustrated in his pictures.

The one test we have to rely upon is the reaction of degeneration. In the progressive cases the reaction of degeneration is apt to be a mixed reaction and this necessitates a careful interpretation of the various responses.

In regard to the treatment of progressive muscular atrophy in children, in the Crippled Children's Hospital in Atlanta we have felt that if the strain upon the muscle groups where the atrophy involves the lower extremities could be relieved by stabilization operations upon the feet, the children could be kept in a fair condition for many years. We have been interested in watching a series of cases where stabilization operations have been done, not with the idea of curing the disease, but to balance the stress and strain, as it were, and avoid undue strain on the involved muscles. We have been gratified with the results.

Dr. Tucker did not touch upon a type of atrophy that I am especially interested in, namely, the atrophy that follows injury to nerves. The atrophy is so extreme in peripheral nerve injury as to necessitate the most careful treatment with massage to prevent an eventual fibrosis in the involved muscles. Should such treatment be neglected the most perfect anastamosis is liable to result in failure, as far as return of function in the affected muscles is concerned.

Dr. Tom A. Williams, Washington, D. C.—With reference to the atrophies due to neurological conditions of which he spoke, we must give the credit to two men, Babinski and Naglotte, for having definitely established the existence of muscular atrophies in tabes as a part of tabes, and due to an infiltration of the anterior spinal roots. It is much commoner than supposed. At some period of life of the tabetic you will find atrophy of that kind which often clears up spontaneously.

We have to remember also with reference to progressive muscular atrophy that Leri twenty years ago studied a large series and found that at least 75 per cent of these cases were syphilitic. They were the subjects of syphilitic radiculitis or of endarteritis of the anterior column of the spinal cord. They were not then true cases of progressive muscular atrophy. My own experience has been that there is no such disease as primary progressive muscular atrophy. The syndrome is due to some cause, which can usually be found. They are either syphilitics or are cases of early syringomyelia, or in a large proportion they are cases of amyotrophic lateral sclerosis in which the upper neuron symptoms are overlooked. I am observing a patient whose case was misdiagnosed progressive muscular atrophy at the Mayo Clinic, and which is definitely and distinctly a case of amyotrophic lateral sclerosis, with marked exaggeration of the reflexes, and not due, as supposed by them, to streptococcic infection.

Then there is also atrophy from overuse. Thus in studying cases supposed to be "traumatic neuritis," one may notice wastage of muscles in the overused parts in people suffering from poor nutrition in whom the atrophy is locally disproportionate to the general wasting. That point in the diagnosis is very important. Dr. Tucker did not emphasize it. The diagnosis of wastage of muscle we must consider, whether the whole man is in a condition of wastage or not. In some cases we must direct our treatment to the general status of the individual. If the atrophy is a local one we should look for the neurological lesion in which the signs are distinct, as in the case of lead and not secondary to primary muscular atrophy which is nearly always, in the first instance, selective in accordance with one of the well known pictures, although there are exceptions. In some of these cases there are distinct differences in the electrical reaction, not in the direction of reaction of degeneration, but in the direction of tonus created by faradism, the number of excitations required to produce tonic contraction in the normal part requiring far more rapid interruption of the current to create a tonic condition.

Dr. M. L. Graves, Galveston, Tex.—Dr. Tucker has given a clarifying discussion of atrophic conditions and their distinction from general emaciation by the fact that they attack the musculature of the body. We are all familiar with such cases as are infectious in origin, or post-infections, and with the luetic form of the disease in which the spirochetes attack the anterior corneal cells and produce focalized atrophy. Occasionally we see cases of atrophy that are progressive in people who have had luetic infection in whom the atrophic condition is not due to the lues but to some other disease.

I have seen two cases of facial hemi-atrophy that were post-typhoid in origin. Certain cases of focal atrophy represent traumatisms occasionally, and sometimes cases in which the atrophy occurs years after a trauma. Some time ago I saw a school teacher who had a stab wound of the median nerve in childhood. It gave her no trouble until after she was an adult, when she began to have paresis and atrophy of the muscles

distal to the injury. Upon operation it was found that the whole median nerve at the bend of the elbow was surrounded by dense adhesions and that ordinary firm fibrous tissue penetrated the nerve and had practically destroyed its function and produced pressure atrophy.

Spinal cord tumors, such as those described by Brown-Sequard, will produce local atrophy in the area of pressure on the side of the lesion, where the sensory disturbance is largely on the other side. Small areas of local atrophy may occur from this.

I have seen cases of atrophy due to syringomyelia. This may originate about the cervical enlargement and cause cavitation, vacuolation and accumulation of fluid with pressure atrophy of the muscles of the shoulder girdle and muscles of the hand. My attention was also directed to the possibility that this could be caused by a cervical rib. Some time ago I saw an Army engineer who had a paretic hand and forearm, with atrophy of some of the muscles. I found that it was due to a cervical rib which had proceeded down to the clavicle, become attached to the clavicle and produced such pressure upon the cervical plexus of the nerves and upon the subclavian artery as to obliterate the radial artery of the hand and produce atrophy of the hand and forearm. The condition was relieved by removal of the cervical rib. After some time the radial artery returned.

The French have called attention to the fact that in many cases of cervical rib there is also syringomyelia and the atrophic conditions are not relieved by removal of the rib. In this particular case, full functional restoration of the arm was produced by the removal of the cervical rib.

A Member.—Has the essayist included in this group for differential diagnosis the lipodystrophia which was discussed yesterday?

Dr. Henry S. Ward, Birmingham, Ala.—Gowers long ago divided the progressive muscular atrophies into two classes: (1) the myelopathies, in which the muscular change is secondary to disease in the motor nerve element; and (2) the dystrophies in which the disease is confined mainly to the muscle itself. In the myelopathies there seems to be an election for the motor nerve element. Chronic poliomyelitis first attacks the anterior horn cells, then invades the pyramidal tracts with exaggerated deep reflexes of the non-affected muscles. Amyotrophic lateral sclerosis early invades the pyramidal tracts and finally the anterio horns cell and often the bulbar nuclei, causing bulbar paralysis. So the three forms of muscular atrophy depending upon lesions of the motor nervous system often blend from one into the other. The dystrophies include the pseudo-muscular hypertrophies and all the familial types of muscular atrophy.

One of the important things in these atrophies is to distinguish between some of the so-called atrophies from disuse, as those connected with arthritis and following trauma. I should never call a case of progressive muscular atrophy a true type that did not have fibrillation and increased reflexes when confined to the shoulder girdle or hand and upper extremities, then the reflexes of the legs are markedly exaggerated. It is very important to differentiate tvpes that are not true progressive muscular atrophy from the true types. Muscular fibrillation and increased reflexes should be looked for, and no patient with progressive muscular atrophy of the genuine type should be taken off of his feet as long as it is possible for him to keep going. If he has an intercurrent disease and becomes bed-ridden, it is practically impossible to get him out again. The same thing holds true with regard to the pseudo-muscular atrophies. It is important to keep them out of bed and using all the muscles they have left. It is remarkable what they can do with a slight amount of muscular tissue. It is surprising what massage and use will do to keep up the nutrition of the muscles and the judicious use of the muscles will often prevent invalidism. Large doses of strychnin may be of value in these cases.

Dr. Tucker (closing).—Dr. Dowman directed attention to the inadequacy and incompetency of the test for the reaction of degeneration. We are far too prone to leave this to assistants who do it carelessly or without understanding it. The partial reactions of degeneration are difficult, especially in dystrophy in the myopathic group, and the nutritional wasting group frequently gives both faradic and galvanic lessening in the electrical test. I thank him also for calling attention to the atrophy following nerve injury. I said that these cases were due to trauma.

I agree entirely with what was said regarding syringomyelia. Of course, I was not picking out the different diseases accompanied by very marked atrophy, usually of the progressive type. I can readily see how overuse may cause muscular wasting, although I have not run across a case of that myself.

I thank Dr. Graves for mentioning spinal tumors and cervical ribs. Atrophy may be connected with both of these conditions.

I did not hear the paper on lipodystrophia. I think when the reflexes are exaggerated and other spastic signs present the condition is usually of the amyotrophic lateral sclerosis type. In a true anterior column defect we get lessened reflexes rather than exaggerated reflexes.

TROPICAL DISEASES AND PUBLIC HEALTH

A PROGRAM OF RURAL HEALTH WORK*

By W. F. Draper, M.D.,
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A program of rural health work which serves to show that, when necessary, health activities may be begun in a simple way and developed and increased gradually is being carried out in Virginia through a cooperative arrangement between the Public Health Service and the State Board of Health.

In the beginning of 1919, only three of the one hundred counties in Virginia were provided with full-time health service of any kind. The remaining ninety-seven had nothing and were showing no signs of unrest because of that fact.

While in every county without exception there were broad-gauge men and women who were eager to secure the benefits of public health work for their communities, the people in general were but little informed on the subject and were more disposed to question the desirability of such measures than to favor their introduction.

As the cities of Virginia are politically distinct and separate from the counties, they pay no county taxes. The county revenues are, therefore, small, being derived in the main from assessed valuations of from $4,000,000 to $8,000,000. Sufficient money to maintain an average county health organization was therefore lacking in most instances and could not be secured without an appreciable increase in the tax rate which would require far more favorable sentiment and active interest than could possibly be aroused.

As the State Health Commissioner was firmly convinced that the carrying out of simple sanitary measures for the prevention of soil pollution and the protection of water supplies would accomplish more toward reducing sickness and protecting the health of the people than would any other single line of work, a program of county health work was developed which possessed three great advantages:

(1) It would accomplish more toward preventing sickness and saving life than would any other single measure practicable.

(2) It was within the available resources of the county and the State Board of Health.

(3) It would serve as the foundation for an efficient well balanced county health department, which might be developed gradually as general recognition of the benefits of the work already done was secured.

The initial appropriation to be provided by the counties was $1500. The State Board of Health contributed $700 and the Public Health Service $300. The total of the annual budget was therefore $2500. State and Service funds were sufficient to supplement local appropriations in 12 counties and this number was undertaken as a demonstration of the plan. For the purposes of the demonstration, the Public Health Service assigned a medical officer to take general charge of the work and two sanitarians who were not physicians each to have immediate supervision of six counties.

The actual details of the work in each county were carried out by a man whose prerequisites were a vigorous body and sound common sense and who had received his training in the field from officers of the Service and the State Board of Health. He was known as the County Sanitary Officer. The ground which he covered may perhaps be shown best by quoting a page from a county fair prospectus which reads as follows:

THE SERVICES OF THE COUNTY SANITARY OFFICER ARE FREE TO ALL CITIZENS OF THE COUNTY. HE IS HERE TO HELP YOU.

Some of the things he will do for you if you ask him:

Have your drinking water analyzed to see if it is pure.

Show you how to protect your well against pollution and how to make it safe.

*Read in Section on Public Health, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Show you how to make the spring safe by protecting it from surface contamination.

Help you select the type of sanitary privy best suited to your conditions and show you how to build it.

He will show you how:

To build a septic tank to care for sewage from the home, school, or factory and where to locate it.

To construct a septic privy.

To make a home-made fly trap.

To screen the home to keep out both flies and mosquitoes.

To prevent both fly and mosquito breeding.

To get rid of rats by trapping or poisoning.

Kind of bait to use and how to mix it.

In general, he will do anything that will help to keep the citizens of this county well and healthy.

County Boards of Supervisors are furnished with monthly reports of the work. At the end of the year, when renewals of the appropriations are under consideration, it can usually be shown that on a few items alone, entirely exclusive of the great bulk of the work, the sanitary officer has saved to the citizens several times the amount of his cost. As this is a matter of considerable importance from the standpoint of securing appropriations, a few examples may be cited:

CARROLL COUNTY

In previous years the county had expended from $600 to $2000 for the treatment and control of smallpox alone. During the current year the total expenditure for this purpose has been less than $50. In running down cases, quarantining, and vaccinating, the Sanitary Officer traveled more than 1250 miles on horseback during the winter months. One hundred and sixty-five persons were vaccinated and 185 quarantines were established. In addition to this, the installation of more than 2000 sanitary privies was secured in a rugged mountainous county where less than 10 per cent of the houses were provided with closets of any kind before.

Although no health official was present when the Board met to fix its budget for the following year, it was stated that the Sanitary Officer had secured in one year as many sanitary improvements as would have been thought possible in five and that his smallpox work had more than saved his salary. The Board provided for the continuation of the Sanitary Officer by unanimous consent.

CHARLOTTE COUNTY

The Sanitary Officer secured the cooperation of the local physicians in an anti-typhoid vaccination campaign. Each doctor set aside certain days for giving the inoculations free of charge. Through cooperating agencies the vaccine also was furnished free of charge. The saving to the people of Charlotte County, based on the lowest cost of materials and charge for physicians' services, is as follows:

3068 doses of antityphoid vaccine at 7 cents each	$ 214.76
3068 inoculations at 50 cents each	1534.00
Total	$1748.76
Annual cost to County of Sanitary Officer	1500.00
Net profit to citizens of County on anti-typhoid item alone	248.76

The Board of Supervisors was unanimous in voting for the continuance of the Sanitary Officer and appropriating the money.

CHESTERFIELD COUNTY

Saving to 286 citizens through antityphoid vaccinations	489.00
Saving to parents of 469 school children through smallpox vaccinations	469.00
Saving to taxpayers through prompt action in preventing rabies epidemic	2700.00
Saving to taxpayers through assistance given in construction of school toilets	2000.00
Saving to citizens through securing 1370 yards of drainage ditching from outside sources	425.00
Total	$6083.00
Annual cost of Sanitary Officer to County	1500.00
Net saving to County on above items alone, which were incidental to the main bulk of the work	$4583.00

This program has been continued for upward of three years with generally satisfactory results. It is now the intention of the State Health Commissioner to recommend to the next General Assembly that a sufficient appropriation be made to assist in establishing a sanitary officer in a much larger number of counties, and eventually in every county in the State which has not been provided with a full-time health unit.

Reference has been made to the practicability of utilizing such a plan for the gradual growth and development of a county health organization. In this connection it may be interesting to note that six of the twelve demonstration counties have already passed from what may be called the first stage of health work to the second stage, where, instead of having only a sanitary officer or a public health nurse, they now have both a sanitary officer and public health nurse working as a county health unit to give to their counties the most effective health administration possible with the resources at their command.

Where such a combination exists the demonstration is showing that under the medical supervision of the Public Health

Service and the State Board of Health various agencies and facilities may be utilized to render to these counties fairly adequate health service. The health activities which can be carried out by a capable sanitary officer and nurse by securing the active cooperation of various useful agencies and skilfully organizing them may be outlined as follows:

(1) *Control of Communicable Diseases*

A. Diagnosis, reporting, isolation, treatment, by county board of health and local physicians.

B. Quarantine, by sanitary officer in cooperation with county board of health and local physicians.

C. Investigation and control of outbreaks and epidemics, by medical officers of the U.S.P.H.S. and state board of health.

D. Public health nursing by county nurse.

E. Smallpox investigations, vaccinations, quarantine, by county board of health and local physicians, assisted by sanitary officer; sanitary officer and nurse both vaccinate when qualified and authorized to do so by supervising agencies and county board of health.

F. Anti-typhoid inoculation campaigns, by local physicians with assistance of sanitary officer and nurse.

G. Cleansing and disinfection, by sanitary officer.

(2) *Child Welfare*

A. Physical inspections of school children, by school teachers under direction of state board of health and state department of public instruction, and under supervision of county nurse.

B. Follow-up work by county nurse.

C. Correction of physical defects by family physicians and by clinics organized by county nurse in cooperation with county board of health and local physicians.

D. Clinics. (1) Tonsil and adenoid, organized by nurse. Operations done by specialists chosen by local physicians.

(2) Eye, organized by nurse. Treatment prescribed by specialists chosen by local physicians.

(3) Orthopedic, organized by nurse. Treatment and operations done by orthopedist in charge of orthopedic wards of state board of health.

(4) Tuberculosis, organized by nurse. Sanitary officer may assist. Examinations made by specialists of state board of health. Follow-up work by county nurse.

(5) Dental, organized by nurse, or sanitary officer, or both. Dental work done by local or state board of health dentists under direction of state board of health dentist in charge of mouth hygiene.

E. Maternity and pre-natal work, by local physicians and county nurse.

(3) *Sanitary Inspections*

A. Privy construction, by sanitary officer.

B. Individual water supplies, by sanitary officer.

C. Foods and food establishments, by sanitary officer.

D. Camps, villages, mines, by sanitary officer.

E. Malaria, controlled by sanitary officer with supervision and assistance of the United States Public Health Service malaria control specialist.

(4) *Laboratory*

All public health laboratory work is done free at laboratory of state board of health.

(5) *Public Health Education*

A. The state board of health portable motion picture outfit and health films are assigned to each county and accompanied by the supervising officer, sanitary officer, and nurse for each county. About thirty shows are given in all sections of the county. The average attendance in each county is 5000.

B. Lectures by United States Public Health Service and state board of health officials.

C. Public talks by sanitary officers and nurses.

D. Organization of junior health leagues in the school by county nurse or sanitary officer.

E. Individual educational work by house-to-house surveys.

F. County fair exhibits conducted by United States Public Health Service, state board of health, sanitary officers and county nurses.

G. Health articles in local newspapers.

H. Publications, signs, placards, circular letters, etc., all agencies.

DISCUSSION

Dr. Ennion G. Williams, State Health Commissioner, Richmond, Va.—We in Virginia consider that we are exceedingly fortunate in having this program carried out by Dr. Draper. What he has told you is not a theoretical program, but one which has been in actual practice for several years.

Dr. A. P. Harrison, State Board of Health, Austin, Tex.—If we have ample funds it simplifies the organization and carrying out of any work to a marked extent, but we have had explained to us this morning that such a task can be successfully carried on with small funds where the organization is very difficult. Dr. Draper has told us that he had only two sanitary men: one doctor in charge of his plan of work, with two sanitary men and other assistants working over a territory comprising twelve counties. It is usually a very difficult process to carry on work successfully in one county where you have a doctor at the head of the work and one or two sanitary inspectors, and possibly a nurse or two. So these men have accomplished a task which, on the face of it, would appear almost an impossibility. We should all be interested in some further details in regard to it. The work, I understand, has been going on for about three years now.

I should like to ask Dr. Draper how many of these twelve counties have been able to provide themselves with a whole-time county health officer, who gives his entire time to the work of that county. I should also like to ask him to give us some details as to the saving of money in the campaign against rabies, and the saving of money in the building of school toilets.

He has mentioned practically all the activities that should be carried on by a county health de-

partment, with possibly one exception, the life extension feature of the work, which has been found very profitable and has come into considerable favor with the people in certain localities. That is where the doctor who has charge of the unit offers to the public the privilege of being examined, of making an appointment and coming to his office and receiving a careful examination, to take stock of his physical condition. Often incipient troubles, cancer, for instance, have been discovered in the early stages when they were still curable and lives have been saved. Work of that kind appeals very much to the people, and if you are fortunate enough to diagnose an early case of a serious trouble there is probably nothing that will make the work of the county health department more popular with the people than this feature of life extension examinations.

Dr. James A. Hayne, State Health Officer, Columbia, S. C.—One objection I have to the plan as outlined by Dr. Draper is this: I have tried to induce medical men to take up, as a career, public health work, and have laid stress upon the fact that an M.D. degree is necessary for the proper carrying out of public health work; that in order for a public health official to be respected in a community and to take his place in the community, his opinion on diseases must be respected by the people of that community. He must be a man whom the medical men of that community look up to as an authority. I cannot understand how the ubiquitous sanitary man travels over six counties, and how he gets his salary and that of the nurse out of $2500. Does he work for $1000 or $1500, or does he work for nothing? We find in South Carolina that it is rather difficult to get over a small county, with 15,000 inhabitants, with a doctor, two sanitary inspectors, and several nurses. I do not see how Virginia can so differ from South Carolina that in Virginia one doctor can cover twelve counties, while in South Carolina he cannot make himself felt over one entire county.

Dr. W. S. Keister, Charlottesville, Va.—A few years ago, when we hookworm people went through the counties, we spent just a few weeks trying to induce the people to get rid of hookworm disease. The program unfolded a little further, and it was decided not only to cure hookworms but to prevent them by putting in sanitary toilets. We were called detectives, privy-builders, and everything else. I believe that the title of privy-builder is one of the most honorable a man can have, for the privy-builders have saved more lives in the South than any one else.

We started on an intensive campaign in three or four counties, setting an example of what sanitation meant by building privies and getting rid of hookworms. The big thing in that was not so much in building the privies, but promoting the public health conscience. Some of us doubted whether that work was worth much, for we knew that when the sanitary officer left the county many of the people would return to their original conditions. In spite of that, many of these counties have put in sanitary inspectors at $1500 a year. Some of them have added a nurse and a few have put in whole-time county health departments.

Looking through a keyhole, we could see a small perspective: the establishment of local health units which would take part of the burden from the State Health Department. We started with the medical inspection of schools, the most spectacular part of public health work, but not the most important. (I feel that sanitation is the most important thing.) That was started in 1914, in Albemarle County. A few spasmodic efforts had been carried out in that county at different intervals. Later, in 1920, it was thought wise to develop a whole-time health department. It was started with a nurse, who preceded the health officer by about six months. Later an office assistant was added, then two nurses, then a sanitary inspector, and later a dentist. Finally we had an organization of eight or ten people. Starting from a small beginning, we have continued this work over several years. The first year the County appropriated $1000 out of $10,000; the second year $2500 out of $10,000; then $7500 out of the $10,000. This year we have been fortunate enough to have a joint health department started by the city of Charlottesville, the county of Albemarle, and the State University, where we hope to put in a public health course.

This is a business, and if we intend to do it properly we must have men who are trained for the work, and we have made it a point to put in new men until we are prepared to give the people the best it is possible to give.

Dr. S. W. Welch, State Health Officer, Montgomery, Ala.—The success of any large undertaking depends upon the ability of the executive to recognize his problem, and his resourcefulness in devising means to meet it. It seems to me that the program which has been adopted in Virginia shows, first, a clear recognition of the problems involved, and, second, a degree of resourcefulness in devising means to meet those problems which is more or less unusual. With a taxable valuation of $8,000,000, to be able to devise a plan that would meet a serious public health problem in an entirely different manner from that which is being used in other states, calls for congratulations from all of us to the directing head of the organization.

In the majority of the newer states a different political unit exists. In my own State the county is the unit. The county elects the health officer and he is the *ex officio* health officer of each municipality in the county. The appropriations from the cities and county are budgeted, and he is the directing head of all the public health activities in the county. In Virginia they have devised a way of meeting a difficult problem by putting non-professional men in charge of the work, which would not be possible in the State of South Carolina. It is more or less fortunate that things can be done in ways other than they are done in South Carolina. If it were not, I do not know what would become of the rest of us. However, I would not say that things are not done in a fairly competent and efficient manner in some parts of South Carolina.

The plan developed in Virginia is worthy of serious consideration by all of us, because in every state there are counties that have not a

very large revenue. We have adopted this plan of doing public health work in Alabama, and it has worked excellently. The Virginia plan has been adopted *in toto*, and, under the direction of Dr. Sharpe, district health officer, a sanitary inspector has been placed in charge of all of the non-medical work. There are certain phases of public health work that cannot be done by any one other than a doctor, but there are a large number of activities that can be done by non-professional people under a doctor who has charge of a number of counties, and that is the plan, as I understand it, that has been worked out in Virginia. It seems to me to be a valuable addition to our public health knowledge.

Dr. John A. Ferrell, International Health Board, New York, N. Y.—As a comparatively small appropriation is required to finance Dr. Draper's working unit, his plan is particularly valuable in providing a health service for those counties having a small population and little wealth. Practically every state has at least a few such counties and the state boards of health have encountered real economic difficulties in supplying them with an adequate health service. If Dr. Draper has developed the best type of health service economically feasible for such counties, he has made a real contribution.

For counties approaching or exceeding the average in wealth and population I should advocate a larger unit of working force directed by a medical health officer. It would cost from $8000 to $12,000 yearly, and in addition to the medical director it would consist of an office assistant, one or more public health nurses, and possibly a sanitary inspector. The medical director should have a strong and pleasing personality, sound judgment, tact, enthusiasm and other qualities essential to leadership. Unless he possesses these qualities he will not justify his salary nor inspire enthusiasm among his associates or those who are to be served, and his accomplishments will not compare favorably with those obtained by an efficient public health nurse or sanitary inspector. There is encountered some difficulty in finding, interesting and training the type of physician who can successfully direct the well rounded county health organization, but the task is not impossible; for at least one hundred directors are already engaged in the work and are making the county health organization a real factor in the field of public health.

It might be well to have as our goal the larger health unit directed by a physician for counties of average or greater resources and the unit described by Dr. Draper for the weaker counties. Time and experience will, of course, permit many improvements in both types of county health units and enable the health authorities to supply the counties weaker than the average with the best health service their financial resources will permit.

I doubt the advisability of sending a public health nurse or a sanitary inspector into a county well above the average in financial resources with instructions to work along certain clearly defined lines with a view to demonstrating that a larger health unit should be developed in such way as to subordinate or eliminate herself or himself. Deliberate self-elimination or self-subordination is not generally expected of an employee. If this worker is assured of his position with the state board of health, and if he understands that when his task of eliminating himself from a county organization is completed, another similar task, or a promotion awaits him, then he might be expected to have the needed incentive to make the plan workable.

Regardless of the type of health organization adopted by the counties, there should be no difference of opinion as to the desirability of obtaining the best qualified staff members available. Their training, practical and scientific, should be as thorough as it is possible to make it. The development of facilities for supplying this training to present and prospective health workers is another important task to which the health authorities are beginning to direct their attention, but its discussion at this time is hardly in order, except to say that it will become increasingly urgent as the development of county health work is extended.

Dr. Draper's work in Virginia was most valuable. He has made a contribution to public health administration which merits our appreciation.

Dr. Draper (closing).—Two counties which we started with a sanitary officer later made appropriation for a whole-time health officer. In one of these counties the State representative went before the Board of Commissioners and told them that if a sanitary officer could do so much work, much more could be done by a health department with a medical health officer. The Board appropriated $5000 and the following year, instead of having a sanitary officer, we had an experienced medical health officer and a complete health unit, and did a splendid piece of work. At the end of the year the people did not appreciate the value of the work and did not appreciate the medical school inspection, but wanted the one man back, so they reverted to the sanitary officer. They could appreciate the small beginning, but not enough people understood the value of the larger work to support it.

The second county, after one year, we also succeeded in getting to put up $5000, and we had $5000 from outside sources. We waited eight months to get the right kind of man. At the end of that time they became tired of waiting, rescinded their action, and used the money for something else. They have, however, a county health nurse.

Six of the counties now have a nurse in addition to the sanitary officer.

I said that $2700 had been saved to the county by the prevention of an epidemic of rabies. One day a dog went mad, traveled in a circle, and bit nine dogs, a hog, and four people. The sanitary officer followed and killed the dogs. The people who were bitten were treated at the rate of $75 apiece, which had to be paid for by the county supervisors. We explained to the board of county supervisors what the cost would have been if the nine dogs had gone mad and had each bitten four people.

There is a sanitary officer in each county, so he is not so very ubiquitous. The supervising officer is not in charge of the county at all, but in charge of the administrative work. The sanitary officer receives a salary of from $1500 to $1800. The difference between that and the $2500 goes into his automobile and transportation. When the nurse is added that costs $2500 more, and they have a $5000 budget instead of a $2500 budget.

There is just one thing I wish to say about public health work as a vocation. It is a good thing to advise physicians, especially young physicians, that there is a splendid career in health work. But in the type of counties where we have been working the physician is not yet the man to do that work. I am a physician, and I have been in those counties. I heard of some of the reports that went to the board of supervisors, that the idea that typhoid was carried by flies and malaria by mosquitoes was simply ridiculous, and merely a scheme to cook up a high priced job for some one who would come in and drive over the county in an automobile. In starting this work, instead of having sanitarians for supervising officers, I had two doctors who were extremely well qualified for the work and who had had excellent results in other fields, and these two doctors did not begin to get the results which my two non-medical sanitarians are getting now. They could not get and maintain the results because their training was not of the kind that led them to get out in the field and with their own hands show people how to dig pits, build forms for sanitary concrete construction work, repair well platforms, and do the countless other homely jobs that people want done and have to be shown how to do. In such work a sanitary inspector is needed, not a doctor. Medical direction is of course necessary and it is the province of the state board of health to determine the policy to be followed in county work and shape its course.

TEN MINUTES WITH VITAL STATISTICS*

By J. H. Florence, M.D.,
State Health Officer,
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Those states that have succeeded in meeting the requirements of the Federal Government and have been admitted into the Federal registration area receive many benefits not enjoyed by those outside of this area. It has been the experience of most health officers in their efforts to meet the Federal requirements that they educate the public, undertakers and funeral directors and medical profession alike. With reference to my own State, we are greatly handicapped because of statutory limitations. Statutes creating the Bureau of Vital Statistics were enacted in 1910, and our present degree of efficiency, based upon Federal requirements, is 60 per cent deaths and 75 per cent births. Admission into the birth area during the next twelve months is anticipated, provided the proper legislation can be secured at the next meeting of our Legislature.

The Bureau of Communicable Diseases and that of Vital Statistics are the clearing houses of health conservation activities. Morbidity and mortality reports must be properly tabulated and interpreted to be of any material value.

Approximately 3000 deaths are reported monthly to the Texas State Board of Health. Of this number 16 per cent, or one out of every six, is an infant less than one year of age. The number of white infants less than one year of age who die during the first year is three times as great during the first seven days as the succeeding three weeks.

A closer study of this mortality reveals surprising results relative to color experience.

The population of Texas is 4,663,000, being 76 per cent white, 16 per cent negro and 5 per cent Mexican. Using 100,000 as a radix, infant mortality experience is white 37, negro 34.5 and Mexican 256. In other words, the Mexican infant mortality is not an obscure factor in the production of high infant mortality.

These facts allow the following interpretation:

Prenatal development of the fetus during the latter months of gestation results in immature infants of low vitality and the child dies of inanition. This scientific fact is a reliable monitor to the physicians whose duty it is to advise properly the expectant mother through this period. A common interpretation of this high infant mortality is that of syphilitic history. It is true when history can be established by a positive blood examination the deduction is logical and true. Too often this statement is used as a camouflage for superficial knowledge, absence of proper instructions as to hygiene, exercise and the proper

*Read by title in Section on Public Health, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

diet, or indifference and non-observance on the part of the mother. The prevailing cause of the mortality following the first seven days of life and prior to the second month is due to artificial feeding.

Contrary to the general supposition, mortality of colored infants is remarkably low under one month, while that of the succeeding months closely follows that of the white experience.

Mexican mortality exceeds that of the negro. This increases during the whole year period, the principal cause of death being inanition, malnutrition and enteritis, direct results of improper feeding, diet, hygiene and sanitation.

Modern methods in the treatment of tuberculosis have operated in no small degree in the reduction of adult mortality.

According to the Federal report of 1920, the average tuberculosis mortality was 114 per 100,000 population. The individual state's experience varies from 39 to 175. The non-resident patients often operate as a modifying factor in a state's normal experience. The present statistical mortality efficiency is 67 per cent.

Texas tuberculous mortality experience during the six months just past is 7.8 plus of deaths from all causes, or 0.9 per cent less than the Federal experience. Using the Farmingham method of calculation, it is fair to assume there are living today 46,000 persons afflicted with tuberculosis.

Like many other Gulf states, Texas experiences a heavy malaria mortality. Particularly is this true in the southeastern, northern and east-central sections. Malaria as the immediate cause of death during recent years has been 20 per 100,000 population for the entire State. Mortality in the malaria area is at least 50 per cent greater.

During the months of August, September and October of the present year there has been an extensive epidemic of dengue in the malarial area. Although it is a reportable disease, its extent can only be surmised, since the statute has been indifferently complied with. The present month reports 65 deaths. If there were 100 per cent efficiency in reporting this would be approximately 100 deaths.

I am indebted to Dr. J. C. Twitchell, State Statistician, for the data used in this paper.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

EXPERIMENTAL INTRAPERITONEAL DIVISION OF ONE URETER*

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Accidental injury to the ureter is one of the two greatest dangers to which a patient is subjected during intrapelvic operations. (The other danger is hemorrhage.) The most frequent involvement of the ureter is complete obstruction produced usually by ligation, sometimes by clamping or kinking. Next in frequency is incision, either partial or complete; then resection of a portion, and finally destruction of its blood supply, leading to necrosis. In a former article[5] sudden complete ureteral obstruction was taken up in detail. It is the purpose of this paper to consider similarly the effects of complete intraperitoneal division of one ureter.

REVIEW OF THE LITERATURE

The literature on this subject is not large as compared with that on ureteral ligation. In Table I is given a summary of various researches.

Number and Kind of Animals.—The number of animals used by most of the investigators was too small to justify the induction of final conclusions. Also it would seem, according to Barney's[1] results, that one must employ both carnivora and herbivora in order not to be misled.

Technic.—The transperitoneal route naturally was the one employed almost exclusively. As to details concerning methods, Willgerodt[11] and Barney[1] are the only ones who describe them adequately. The former tried to maintain long-continued absorption of urine from the peritoneum by simply severing the ureter and fastening it to the bladder wall within the peritoneal cavity; but the firm adhesions which were formed rapidly closed up the cut end in all of the first five dogs upon which he did this operation. So in order to avoid this obstruction of the ureter, he tried the expedient of excising a portion of the bladder wall, including the ureteral opening. The hole in the bladder was then closed and the resected ureteral stoma with its adjacent portion of bladder wall was allowed to lie free in the abdominal cavity. This dog died in twelve days. A diffuse purulent peritonitis was found and also a large retroperitoneal abscess into which the ureter opened. The bladder wound had healed perfectly.

In the next dog he did a precisely similar operation with the added feature of inserting into the ureteral opening a piece of rubber tubing about 10 cm. long, the free end of which was placed between coils of intestine. This dog died 8 days later. The autopsy showed between the intestinal folds an abscess, which was thoroughly walled off and in which lay the tube. The peritoneum was entirely normal. Again he repeated this experiment, using this time a tube of ivory. After 8 days he killed the animal and found the end of the tube plugged with actively proliferating granulations. The peritoneum glistened, although it contained 40 c. c. of yellowish reddish fluid. In still another dog he used a silver tube, and at the end of 4 days found that it opened into an interintestinal encapsulated abscess. This last experiment, repeated in every detail in another dog, showed on the seventh day the tube sealed by adhesions of omentum and gut. The ureter and kidney were filled with pus.

Mortality and Morbidity.—The length of time the animal lives after operation, and especially the fact whether it lives on indefinitely and in a healthy condition, are points of the greatest significance in the application of these experiments clinically. In Table I, I have ascertained 61 per cent

*Read in Section on Urology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

as the approximate average mortality, giving each investigator an equal percentage rating. This obviously is unfair, as probably more than half of all of the animals reported in the entire table were operated upon by Willgerodt[11] and Barney;[1] and the mortality with these two men was only 33 and 36 per cent, respectively. Accordingly, giving the work of these two experimenters its proper weight, the mortality would be reduced to about 40 per cent. Also, considering only those writers who stated the number of animals used (this includes Willgerodt and Barney), the mortality is 35 per cent. On the other hand, there is no reasonable doubt that if some of the animals which were killed during the first or the second week had been allowed to live longer, they would have died spontaneously, thus increasing the mortality. So, on account of this factor, 10 or 15 per cent may safely be added to the estimated 35 or 40 per cent just mentioned, making finally 50 per cent as the approximate mortality. Still further criticism must be made, namely: if Barney had used twice as many carnivora as herbivora (he employed 14 carnivora and 26 herbivora) his mortality would have been twice as large, thus increasing materially the 50 per cent mentioned above. Thus it will be seen that an accurate statement as to what the true mortality is in the researches to date in this field is at least very difficult, if not impossible.

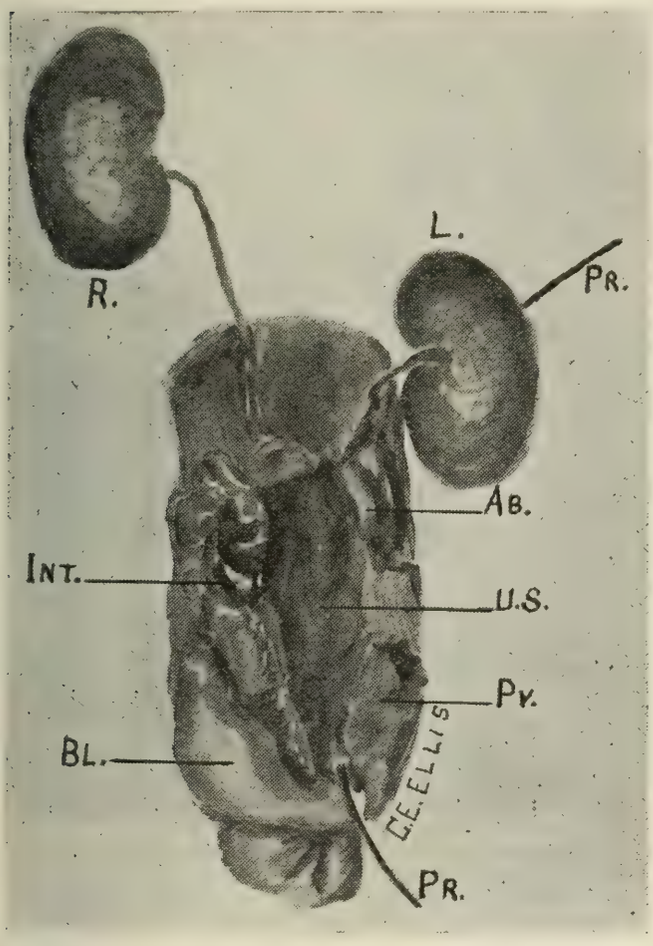

Fig. 1.—Specimen from a rabbit which died 54 hours after complete division of the left ureter near the bladder. The chief feature is the urinary sac (U. S.) formed by the bladder (Bl.), intestines and omentum (Int.), pelvic wall (Pv.), and abdominal wall (Ab.). These structures are pulled aside to show the interior of the urinary cavity. A probe (Pr.) was passed on the operated side through the kidney and the ureter; the point of emergence near the bottom marks the location where the ureter empties into the newly formed urinary space. R., right kidney. L., left kidney. Compare Fig. 2.

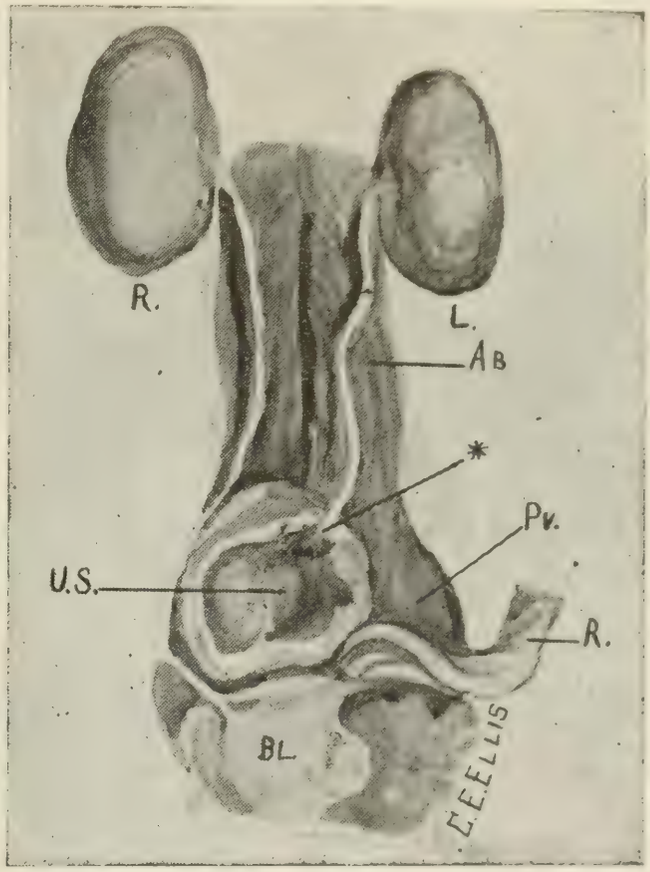

Fig. 2.—Slightly diagrammatic drawing from a rabbit 11 days after complete division of the right ureter near the bladder. The most important point is the newly formed urinary sac (U. S.). Only the dorsal portion is shown; the ventral part was composed of adherent intestines and omentum which have been torn away, and bladder and rectum which have been retracted. *, point of entrance of divided ureter into this sac. R., rectum. Other abbreviations the same as in Fig. 1. Compare Fig. 1.

The cause of death in Barney's[1] carnivora (his herbivora did not die spontaneously) "was primarily sepsis, but certainly uremia played its part." The other investigators agree pretty well with Barney, except that perhaps they have a tendency

to assign greater importance to uremia. It is of interest to note in this connection that nearly every one who never has heard of these experiments or who has done them before consulting the literature, has been surprised that the mortality is not 100 per cent, and wonders why the animals do not all die promptly instead of living on indefinitely, as is the case with many of them.

The morbidity in these experiments varied greatly and was all the way from illness severe enough to produce prompt

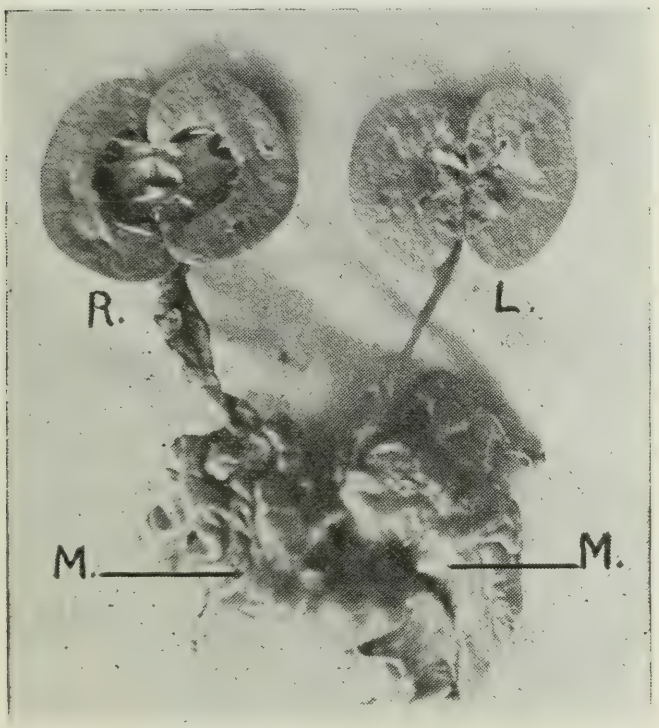

Fig. 3.—Kidneys, ureters and bladder with adherent adjacent tissues from a dog 20 days after complete division of the right ureter near the bladder. R., right kidney. L., left kidney. M., mass of adherent structures including bladder and portions of omentum, intestines and pelvic wall, surrounding the point where the ureter was severed and occluding the opening securely. Note on the operated side the dilatation of the kidney pelvis and the enlargement of the ureter. The latter was much more noticeable in the fresh specimen before the contents escaped. Compare Fig. 4.

death to complete absence of any signs of sickness. Symptoms are described by only three investigators, Willgerodt,[11] Sampson[8] and Barney.[1] Excluding Sampson, whose experiments included but two animals, the symptoms described by the other two agree very well: first vomiting, then diarrhea; later coma and convulsions. (These symptoms are common also in the human.) Distinct signs of illness are reported in probably less than half of the animals included in Table I. The earliest and most frequently noted symptom was vomiting, which, when it occurred, was confined mostly to the first two days. Diarrhea was of nearly equal frequency; it usually followed the vomiting and lasted much longer, sometimes a week or more. During the second week, convulsions and coma were not infrequent, especially in the fatal cases. A rise in temperature or an increase in the rate of the pulse or of the respiration were rarely noted, not necessarily because these signs were not present

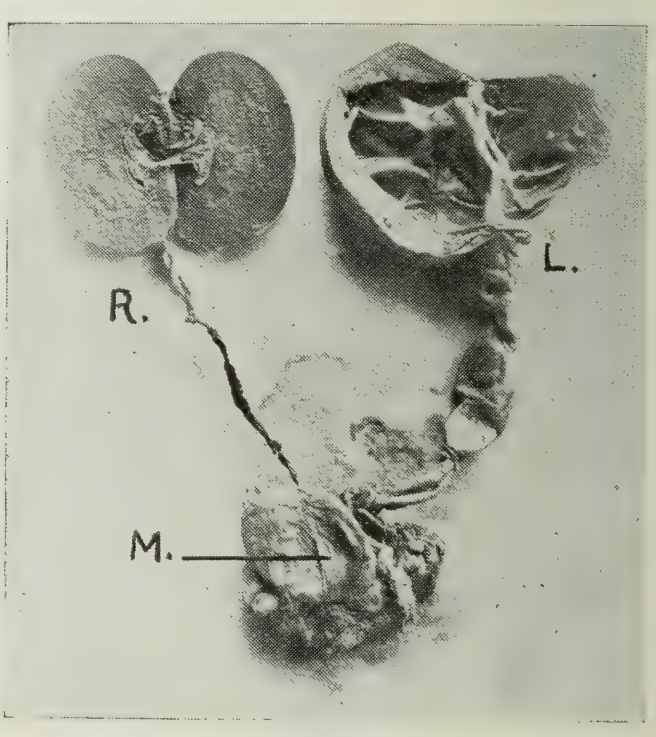

Fig. 4.—Kidneys, ureters and bladder with adherent adjacent structures from a dog 42 days after complete division of the left ureter near the bladder. Abbreviations the same as in Fig. 3. Note the marked cystic condition of the kidney and the extreme dilatation of the ureter on the operated side. Compare Fig. 3.

but rather because the observations were not taken. Least frequently of all were symptoms of bladder irritation mentioned. Most of the symptoms occurring in these experiments, especially vomiting, diarrhea, convulsions, and coma, were supposed usually to be toxic in origin on account of the absorption of urine. Infection no doubt played a role; and the proximity of the bladder and the rectum to the prime source of trouble would explain in part at least the irritation of these organs.

Changes at the Point of Ureteral Division and Involvement of the Peritoneum and Retroperitoneal Tissues.—In by far the great majority of instances local adhe-

sions prevented wide diffusion of urine. Straus[9] is the only investigator who has not found this to be the case. In some instances, the reaction is so prompt and vigorous that but little urine escapes. Barney[1] found that the "divided end (of the ureter) became occluded (1) by direct adhesions to gut or omentum; (2) by blood clot in its lumen, often extending almost up to the kidney; and (3) by organization

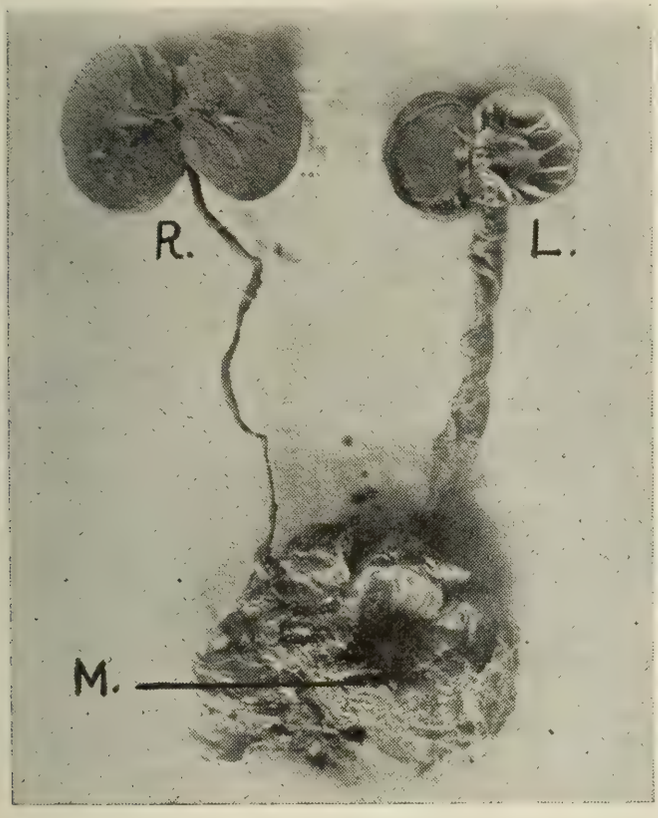

Fig. 5.—Kidneys, ureters and bladder with adherent adjacent structures from a rabbit 264 days after complete division of the left ureter near the bladder. Abbreviations the same as in Fig. 3. Note especially the small size of the kidney on the operated side. This general atrophy developed in spite of the fact that the organ became markedly cystic. It was filled with a soft solid material which has been left *in situ* on one side of the kidney but removed on the opposite side to show the cystic state. This condition of the kidney, together with the marked dilatation of the ureter, demonstrate the atrophy to be secondary, that is, following primary cystic enlargement. Compare Fig. 6.

of exudate, seen only in late cases. Often no special cause could be demonstrated."

DeQuervain[2] says that "wounds of the ureter have a great tendency to become harmless through cicatrization. Only in cases where* * *this proliferation does not occur the condition goes on to peritonitis."

Sampson[8] considers that the walling-off process is so constant that the ultimate result of complete severance of the ureter usually is the same as that of ligation. The dykes around the breach in the ureter are formed by the omentum, intestines, bladder and pelvic and abdominal walls, one or more of these structures always being involved.

In the animal of Willgerodt's[11] which developed diffuse peritonitis, he divided a second time the dilated ureter which he had severed completely three weeks previously. The second incision was cephalad

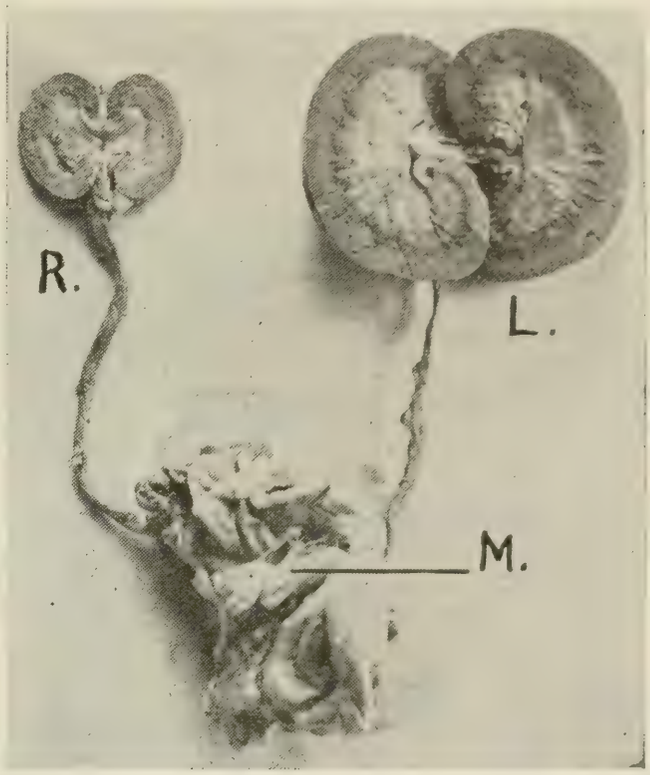

Fig. 6.—Kidneys, ureters and bladder with adherent adjacent tissues from a dog 301 days after complete division of the right ureter near the bladder. Abbreviations the same as in Fig. 3. Note that the ureter on the operated side exhibits comparatively little enlargement, that the kidney is exceedingly small and that it has suffered but little cystic transformation. These features mark this renal atrophy as being primary, that is, occurring with but little previous enlargement. Compare Fig. 5.

to the first and let loose into the free peritoneal cavity a fluid which showed microscopically "pus detritus." Under these circumstances, diffuse suppuration would be practically inevitable.

In regard to the pathogenesis of free fluid in the peritoneal cavity, the following statement by Barney[1] describes the process the most accurately:

"* * * in spite of the great power of absorption possessed by the peritoneum, it cannot keep pace with the great effusion occurring soon after the peritoneal insult. Hence the free fluid is seen in early cases. The absence of fluid in later cases may be explained by the fact that the effusion of urine and serum has stopped and that already

TABLE I—SUMMARY OF

Experimenter and Date	Animals and Number	Technic	Symptoms	MORTALITY AND AGE OF SPECIMEN			
				Died Spontaneously (Mortality)	Time	Killed	Time
Israel, O., 1881	4 dogs	Extraperitoneal route Divided ureter near renal pelvis and diverted all of urine on one side into free peritoneal cavity. Wound closed in layers	Not stated	4	4 to 5 weeks	None	.....
Strauss, M. I., 1890	Dogs and guinea pigs. Number not stated	Intraperitoneal route No details given	Not stated	Guinea pigs Dogs	About 2 days and 5 to 8 days	None	.....
Tuffier, M., 1890	Rabbits Number not stated	Not stated	Not given	All	8 to 10 days	None	.....
Willgerodt, H., 1897	11 dogs	Intraperitoneal route Renal end of divided ureter sewed to bladder wall intraperitoneally. For further details, see text.	Vomiting first two days; then diarrhea for several days; finally coma and convulsions. Some of these symptoms in nearly every dog. Attributed to uremia	4 (?)	8 to 12 days	7 (?)	8 to 21 days
Sampson, J.A., 1904	2 dogs	Intraperitoneal route No details given	"Convalescence of both dogs most uneventful"	None	.....	2	3 to 4 weeks
Barney, J. D., 1910	Rabbits 25 Guinea pig 1 Dogs 11 Cats 3 Total 40	Intraperitoneal route Ureter "* * * ligated with No. 0 chromic catgut at about the pelvic brim, and divided on the proximal side of the ligature"	Vomiting and diarrhea "occasionally" in dogs and cats. Rabbits "but little if at all affected"	14 dogs and cats. "Dogs and cats always die of sepsis." Uremia, also, a contributing factor	4 to 11 days	25 rabbits "Rabbits always recovered"	1 to 7 (?) days
Summaries and Averages							
Six investigators 1881-1910	Dogs 28+ Rabbits 25+ Cats 3 Guinea pigs 1 Total 57+	Too miscellaneous to be summarized	Vomiting early; then diarrhea; coma and convulsions later. Symptoms attributed mostly to uremia, tho infection played a part	About 61%	Two days to 5 weeks	About 39%	One day to 4 weeks

TABLE II—SUMMARY OF

Number and Kind of Animals	Age of Specimens	Died Spontaneously	Killed	General Condition	Site of Ureteral Division	Peritoneum
18 Rabbits	20 hours to 264 days	14 animals 78% mortality	4 animals 22% recoveries	Excellent, 4; good, 2; poor, 10; no record, 2. Chief symptoms, quietude anorexia, weakness and diarrhea.	Adhesions in all; delicate in younger, firmer in older specimens. Urinary sac formed by adhesions of bladder, intestine and abdomino-pelvic wall, 11. Mild adhesions, no sac, 3. Dense adhesions, no sac, 3. No record, 1.	Normal, 14 Slight or moderate peritonitis, 4
6 Guinea pigs	1½ to 15 days	6 animals 100% mortality	No animals No Recoveries	Excellent until a few hrs. before death, 4. Sick all of time, 2. Symptoms about same as in rabbits	Adhesions in all; delicate in younger, firmer in older specimens. Urinary sac formed as in rabbits, 4. Firm adhesions, no sac, 2.	Normal, 5. Mild peritonitis, 1 (?)
16 Dogs	20 hours to 301 days	10 animals 63% mortality	6 animals 27% recoveries	Excellent, 4. Good, 2. Fair, 2. Poor, 8.	Adhesions in all but one; delicate in younger, firmer in older specimens. Urinary sac formed as in rabbits and guinea pigs + omentum, 4. Mild adhesions, no sac, 4. Dense adhesions, no sac, 6. No record, 1	Normal, 11. Normal (?), 1. Mild to marked diffuse peritonitis, 3. No record, 1
Summary, 40	20 hours to 301 days	30 animals 75% mortality	10 animals 25% recoveries	Excellent, 32%; good, 11%; fair, 5%; poor, 52%. Chief symptoms, quietude, anorexia, weakness and diarrhea	Adhesions, 97.5%. Urinary sac, 50%. Mild adhesions, no sac, 18%. Dense adhesions, no sac, 29%	Normal, 79% Infected (usually not severely), 21%

REVIEW OF LITERATURE

AUTOPSY FINDINGS					REMARKS
At Point of Division of Ureter	Peritoneal Involvement	Retroperitoneal Tissues	Kidney and Ureter	Abdominal Wound	
Closure of ureteral incision by adhesions of peritoneum and adjacent viscera	No diffuse peritonitis	Not involved	In 3, hydronephrosis; in 1, gangrene of the kidney	In 3, primary union; in 1, urinary fistula 10th day, which closed spontaneously 18th day	Object of operations was production of continuous absorption of urine through peritoneum. Local adhesions prevented this
Apparently but little reaction	Marked peritonitis in most if not all animals. Decomposition of urine, which was diffused throughout the peritoneal cavity	Not involved	No statement	Infected in all cases. Not possible to obtain primary healing	Straus holds infection comes from two sources: (1) abdominal wound and (2) interior of intestine through its wall
Not stated	"Serious inflammation" in all	Probably not involved	No statement	No statement	Insufficient details render this report very unsatisfactory
Seven, closed by adhesions Four, ureter opened into abscess	One, diffuse peritonitis. Occurred after dividing ureter a second time when already infected. See text.	Abscess in 2	Both dilated in nearly every instance	In 2, infection; in 4, primary union: in 5, probable primary union	Results of escape of urine into peritoneal cavity: (1) local adhesive peritonitis; (2) absorption leading to uremia
Local adhesions occluded ureter	Not involved	Not involved	"Moderate hydroureter and hydronephrosis"	No infection	These two dogs were the beginning of a series which was not completed
Occlusion by (1) adhesions to gut or omentum, (2) by blood clot in lumen of ureter, (3) by organization of exudate. Walling off of ureter in 77%, especially in rabbits. Sometimes "cyst - like cavity" formed around cut end of ureter	Peritonitis always found; earlier in rabbits than in dogs but more frequently diffuse in latter. In herbivora, localized at side of divided ureter. Free fluid containing urea in about 50%, greater during first 48 hrs. Cultures peritoneal cavity, positive all dogs and cats and 50% rabbits	Edema, especially in rabbits	Noticeable or marked dilatation of both in 66%; oftenest, rabbits. Fluid under great tension	"Primary union * * * in 50% of herbivora; never in carnivora"	Microscopical study was made, but results are not important
Marked limiting adhesions in 75%	Diffuse peritonitis in 25%	Rarely involved	One or both dilated in about 83%	Clean, about 67%. Infected, about 33%	Too miscellaneous to be summarized

WRITER'S EXPERIMENTS

Retroperitoneal Tissues	Abdominal Wound	Kidney Side of Operation	Ureter Side of Operation
Normal, 12. Edematous, 3. Containing urinary sac, 1. Hemorrhage, 1. No record, 1	Healed ideally in all	20 hrs. to 8 da., congested and edematous, 12. 11 to 22 da., cystic and moderately enlarged. 157 da., cystic and markedly enlarged. 129 to 264 da., cystic and smaller than normal, 2. No record, 1	Prior to 11th da., slight enlargement, 12. After 11th da., marked dilatation, 6. Ureter dilates much earlier than kidney
Normal, 3. Edematous, 2. Containing urinary sac, 1	Healed ideally in all	1½ to 10 da., congested and edematous, 5. 15 da., cystic and considerably enlarged, 1.	1½ to 10 da., slight enlargement, 5. 15 da., diam. 4 x normal, 1
Normal, 13. Containing urinary sacs, 2. No record, 1	Normal, 9. Infected superficially, 6. No record, 1	20 hrs. to 9 da., slightly enlarged, 6. 18 to 32 da. and 182 da., moderately cystic and enlarged, 6. 203 da., very cystic and enormously enlarged, 1. 210 da., moderately cystic and atrophied to one-fifth normal size, 1. 301 da., solid and atrophied to one-fifteenth normal size, 1. No record, 1	20 hrs. to 9 da., slight dilatation to 3½ x normal diam., 6. 18 to 32 da., dilatation from 2 to 7 x norm., 5. 182 to 301 da., enlargement from 4 to 12 x norm. diam., 1. No record, 1
Normal, 74%. Edematous, 13%. Containing urinary sacs, 13%	Aseptic, 85%. Infected (generally not severely), 15%	1st 10 da., slightly enlarged. 10 to 32 da., moderately cystic and enlarged. 32 to 301 da., cystic and enlarged or cystic and contracted or solid and contracted. Usually enlarged.	1st 10 da., enlarged slightly. 10 to 32 da., 2 to 4 x norm. diam. 32 to 301 da., 4 to 12 x norm. diam.

poured forth is sooner or later absorbed in spite of the presence of peritonitis.

"The fluid was usually clear, yellowish, and of a urinous odor. When tested it always showed the presence of urea. Occasionally it was bloody and turbid and in carnivora purulent."

As to the source of the infection, whether localized or diffuse, there seems to be no doubt that it must come from one or more of three sources, namely, (1) the blood, (2) the urine, and (3) the intestinal tract by migration through its wall. Barney considers the last the most likely. On taking numerous cultures from the intraureteral fluid several days after ligation and also from the urine as it escaped from the incised ureter immediately after complete division, he found these fluids all sterile. These results, Barney[1] says, "agree entirely with those obtained by Gayet and Cavaillon[3] in similar experiments. * * * This is sufficient, I think, to prove that infection does not come through the urine or through the kidney." On the other hand, when Barney found the gut adherent to the cut end of the ureter, on taking cultures both from the renal fluid and from scrapings of the mucosa of the adjacent intestine, he found in each instance pure cultures of precisely similar cocci. While he does not claim that this evidence is final proof, he very rightly considers it to be "most suggestive." In regard to the blood as a source of infection following complete division of the ureter, neither Barney nor any other investigator offers any evidence or opinion.

Another factor which may influence the occurrence of infection is the composition of the urine. This may have a great deal to do in causing the diversity of results found in different kinds of animals and in the same kind at different times. Lumiere, Lumiere and Chevrotier[6] have shown "that in laboratory animals, especially dogs, the urine varies considerably from day to day, even under a constant regime * * *." This may "explain the contradictory results of experiments in so-called healthy animals." The reaction of the urine also must be considered, especially as this chemical condition effects bacterial growth. Park,[7] for example, has shown that the streptococcus, staphylococcus, colon ballicus and bacillus proteus valgaris do not multiply in strongly acid urines, while the staphylococcus and colon bacillus will grow in moderately acid urines. These facts of bacteriologic research, taken in connection with the other data given above, constitute a problem which, as far as the writer knows, no one has worked out.

The retroperitoneal tissues are invaded still less frequently than the general peritoneum. The ureter being a retroperitoneal structure, one might think that the urine would work its way up the side of this tube. But this seems to be a rare occurrence. Willgerodt's[11] dogs which developed abscesses behind the peritoneum were subjected to more than simple division of the ureter. In one he resected a small piece of the bladder wall, including the normal vesical opening of the ureter, as explained above, and in the other he inserted an ivory tube into the renal end of the severed ureter. These extra procedures may explain in part at least the involvement of the structures posterior to the serosa.

The Abdominal Wound.—The healing of this incision is about the same in this operation as in the average laparotomy in animals. In one of Willgerodt's[11] dogs the wound separated on the fifth day and allowed the intestines to prolapse. This is not by any means an unknown accident even in aseptic human cases. Straus'[9] statement that it is impossible to obtain primary union of the abdominal wall after division of the ureter is abundantly disproved by the other investigators.

The Kidney and the Ureter.—In practically every animal in which any obstruction developed at the point where the ureter was severed, more or less dilatation of both of these structures was found; and in a few instances hydroureter and hydronephrosis occurred without any demonstrable obstruction. The degree of distention of these structures was often marked. Willgerodt[11] and others frequently compare the size of the ureter to that of a lead pencil or of the little finger. No experimenter seems to have kept an animal long enough for secondary renal atrophy to supervene. In many instances, the intrauretero-renal fluid was purulent. Of course, to the extent that ureteral blocking occurs at the point of division, to the same extent the ultimate results will be

precisely similar to those of simple ligation. In my experiments on ureteral ligation,[5] I found that the fluid which collected above the ligature nearly always contained bacteria, contrary to the observations of Barney.[1] Part of this discrepancy may be due to the fact I kept most of my animals alive longer than Barney kept his, thus allowing more time for the development of infection.

A brief summary of the experimental work on intraperitoneal complete division of one ureter is as follows: six investigators have taken up this subject at various intervals from 1881 to 1910. They operated upon more than 57 animals, chiefly dogs and rabbits. Their mortality was about 50 per cent. General symptoms, particularly vomiting, diarrhea, coma and convulsions, occurred frequently. The cut end of the ureter was occluded by adhesions in about 75 per cent of the animals. Diffuse peritonitis developed in about 25 per cent of the cases, while the retroperitoneal tissues were rarely involved. The abdominal wound healed aseptically in 67 per cent of the experiments, fully as high a percentage as is found in most aseptic laparotomies in animals for other purposes. The kidney and ureter were practically always dilated whenever appreciable obstruction to the ureter was produced. The most significant fact of all is the limiting adhesions which close the ureteral incision, check the urinary leakage and prevent the development of diffuse inflammation.

WRITER'S EXPERIMENTS

Technic.—This was aseptic in every particular. The details were the same as those carried out in the writer's experimental work on ligation of the ureter.[5] That the method was effective is evinced by the fact that there was almost no evidence that any infection was introduced into the peritoneal cavity through the laparotomy opening. The incision was always made as far caudad as possible and approximately in the medial line. The bladder was pulled up outside the abdominal cavity, thus bringing up within easy reach the lower portions of the ureters which lie in the posterolateral ligaments of the bladder. The ureter usually was dissected from its bed for about a half inch before it was divided. In the rabbits and guinea pigs the ureteral artery was severed with the ureter because it was not practicable to separate them. In most of the dogs the ureter was isolated from its artery and the latter was left uninjured.

No ligature was placed on the vesical end of the ureter for three reasons: first, probably no urine escaped through this end because in normal animals the uretero-vesical valve prevents any reflux of urine from the bladder into the ureter. This fact has been demonstrated by numerous experimenters. Secondly, leakage of urine from the bladder through the vesical segment of the severed ureter would not invalidate the object of these investigations. In the third place, these experiments were planned to simulate as nearly as possible accidental division of the ureter in operations upon human beings where, of course, no ligature would be placed. In a few of the dogs the renal end of the divided ureter was mobilized thoroughly for about one inch in order to give the escaping urine free access to the peritoneal cavity and to avoid infiltration of the tissues retroperitoneally. This procedure, however, was unnecessary, for retroperitoneal involvement was not found in any of the dogs where this was not carried out. The abdominal wound was closed in three layers and no dressings were applied. As to care following the operations, all of the animals were kept in excellent quarters which were properly heated during cold weather. The rabbits and guinea pigs were handled very carefully, but the dogs had to be left with a keeper, who handled them very roughly and was not careful in feeding them.

Eighteen rabbits, 6 guinea pigs and 16 dogs were operated upon in this investigation, a total of 40 animals. Good material was obtained from nearly all of them.

Rabbits.—From these animals specimens of the following ages were obtained: one, 20 hours; one each, 1, 1½ and 2 days; two, 2¼ days; one each, 3½ and 4 days; two, 4½ days; and one each, 5, 8, 11, 22, 129, 150, 157 and 264 days. The mortality was 78 per cent in spite of the fact that they had most excellent care. About 56 per cent were very ill all of the time. They were quiet, would not eat, were very weak and almost uniformly suffered from diarrhea. A large proportion of the rest were ill at first, but recovered after one to five days; the 157-day rabbit belongs in this group. A very few were in good condition from the first and then died rather suddenly. The one that was killed on the 129th day was in fine condition practically all of the time.

The cause of death in the 78 per cent that died spontaneously probably in most instances was toxemia due to absorption from the retained, decomposed and more or less infected urine. This, however, is a negative assumption due to the fact that usually no other cause could be found from the autopsy findings. Those that died soon after operation may have succumbed from shock.

Autopsy Findings: Ureteral Incision.—In 100 per cent of the rabbits definite adhesions were formed walling off the region of the operation and preventing the diffusion of urine. In 70 per cent a very definite cavity or sac was formed bounded usually by the bladder, the abdomino-pelvic wall and some portion of the intestinal tract; in females the uterus, etc., were included. (Figs. 1 and 2, U. S.) It is surprising how infrequently the omentum was involved, contrasting in this

regard with the dogs. Sometimes in rabbits not even the intestine was included. These sacs always communicated with the ureter of the operated side through the severed end. These spaces differed greatly in size and shape in different rabbits, varying in various dimensions from about 1 to 9 centimeters. Three of the largest ones extended up to or above the kidney of the same side. (Fig. 1, U. S.) In the older specimens the adhesions were stronger, of course, than in the younger ones. As to the relation between the size and the duration of the lesion, the largest cavities with one exception occurred in specimens three weeks old or less. These sacs were always filled with urine or a urinous fluid and the inner surfaces were covered with incrustations. In the 157-day rabbit there were three intraabdominal urinary cysts: one at the right of the bladder, one at the apex of this organ, and one in the region of the appendix. The one at the right of the bladder probably was formed first and the others secondarily. One of the 4½-day rabbits had a moderate sized intraperitoneal sac which communicated with a very large retroperitoneal one. The latter no doubt was formed secondarily. In four animals the adhesions around the point of division of the ureter were formed so promptly and were so strong that the ureteral opening was occluded at once and no urinary cavity was formed. (Fig. 3, M.)

Kidney and Ureter.—In the specimens a few days old the kidney was more or less congested and there was slight dilatation of the pelvis. This enlargement usually increased proportionately with the age of the specimen. In lesions several weeks old enlargement and sacculation usually were marked and the cavity always was filled with urine or a urinous fluid not under tension. Two of the oldest specimens, however, presented exceptions to the rule of general enlargement found especially in more recent lesions; for in the 129- and 264-day rabbits, although the kidneys on the side of operation were cystic, yet they had undergone general atrophy, or diminution in size so that they were distinctly smaller than normal. One of these is shown in Fig. 5. This is a case of secondary atrophy as is explained in the description of the figure. The ureter was slightly distended in recent specimens and in older ones it was dilated from two to eight times its normal diameter. (Figs. 3, 4 and 5.) On the whole, the ultimate changes in the kidney and the ureter following complete division of the latter are the same as those described by the writer in a former article on ligation of the ureter.[5]

Peritoneum, Retroperitoneal Tissues and Abdominal Incision.—The peritoneum seldom was infected and was not involved otherwise except as it helped to form the urinary cysts. There was no free fluid in the abdominal cavity. The peritoneum does not allow the urine to be broadcasted throughout the peritoneal cavity, but dams it back by adhesions, forcing it to accumulate in a newly formed urinary sac in about 70 per cent of the rabbits and ultimately in the ureter and the kidney in all of them, so that the results of ureteral division are the same as those of ligation except that the effects of the former appear more slowly. (Figs. 3, 4, 5 and 6.) This walling off of the urine as if it were pus is the most significant fact demonstrated by these experiments. The retroperitoneal tissues were involved in only four instances: in one of the 4½-day rabbits there was a large retroperitoneal cyst; in two, there was considerable edema, while in one marked hemorrhage was found. The abdominal incisions all healed normally. The amount of infection present in the structures close to the urinary tract was surprisingly small considering the fact that bacteria could be found in abundance in the urinary spaces, the ureters and the kidneys.

Guinea Pigs.—Six specimens, 1½, 3, 4½, 5, 10 and 15 days old, were obtained from these animals. The mortality in this group was 100 per cent. Four of them seemed to be in excellent condition after operation and died suddenly without apparent cause. The other two were ill all of the time and their deaths were sudden. In none of them did autopsy reveal a sufficient explanation of death. In four it might have been due to absorption from the urinary space formed around the point of division of the ureter. In the other two no such sac was found; and one of these lived longer than any of the others, dying on the fifteenth day.

Autopsy Findings.—In every one of the guinea pigs definite adhesions limiting the spread of the urine were produced around the incision through the ureter. In four of them cavities were formed, varying in various measurements from 1.3 to 2.75 centimeters and precisely similar in every way to those described in the rabbits. In two pigs firm adhesions sealed the incision in the ureter and no sac was found. The peritoneum was involved in only one animal. The retroperitoneal structures were normal save marked edema in one pig and the formation of a urinary space in another. All of the abdominal wounds healed aseptically. The kidney on the operated side was more or less congested in all of the more recent specimens; in the 15-day one there was also considerable hydronephrosis. The corresponding ureters were dilated two to four times their normal size. The amount of infection present was exceptionally small. On the whole, the reaction of the guinea pigs to the operation was very similar to that of the rabbits except that the former all died much sooner so that no older specimens were obtained from them. For further details, see description of younger rabbit specimens.

Dogs.—In our series of these animals we obtained the following specimens: one, 20 hours; one each, 5¼, 6 and 7½ days; two, 9 days; one each, 18, 19½, 24, 28, 32, 119, 182, 203, 210 and 301 days. Although the mortality in this group was high, 63 per cent, yet it was decidedly lower than in the guinea pigs and rabbits. The fact that the weather was cold and that the dogs had to be left with a caretaker who did not handle them well may have contributed to this result. Urinary absorption, no doubt, was an important element, especially in the four dogs in which a new urinary space was formed. The symptoms varied considerably. The four that were allowed to live from 119 to 301 days were in excellent

condition all of the time. This was true even of the 301-day dog, which developed a rather long-continued lumbar fistula. Of those that died spontaneously, about one-half were in poor condition throughout the entire time and the other half were in good condition at first and very sick later. Vomiting and diarrhea were not uncommon and coma frequently supervened a few hours before death.

Autopsy Findings: Ureteral Incision.—In all but one dog there were limiting adhesions in this location; in six, they were strong and closed the opening very securely; in three they were rather weak. A new formed urinary sac into which the divided ureter of the corresponding side emptied was found in four of these animals; two of these were retroperitoneal and two intraperitoneal. The structures almost uniformly involved in these adhesions were the omentum, bladder, intestines and abdomino-pelvic wall. In only one animal was the omentum not included. This finding contrasts with that in rabbits and guinea pigs where the omentum usually was free. This behavior of this structure may account for the less frequent formation of urinary spaces and the more prompt occlusion of the incision across the ureter in the dogs than in the other two groups. This feature also would naturally lead to a lower mortality in the dogs.

Kidney and Ureter.—In the dog that lived the shortest time (20 hours) the kidney on the operated side was approximately normal. In all of the other dogs this kidney was more or less cystic and was dilated from about 1¼ to 15 times normal size, depending mostly on the age of the specimen; during the first two or three months the older the lesion the more marked usually was the enlargement. In the oldest specimen, however, the kidney on the operated side frequently showed more or less diminution in size. This was the case with the 210- and 301-day kidneys; both were reduced in size, the former to about one-fifth and the latter to about one-fifteenth of normal. The 210-day organ was cystic, the decrease in size, though noticeable, was not extreme and the corresponding ureter was markedly dilated. These findings are typical of secondary atrophy. This kidney was precisely similar to the rabbit kidney shown in Fig. 5. The 301-day kidney showed practically no cystic transformation, it was exceedingly reduced in size and its ureter was but little dilated. (See Fig. 6.) These features place it in the group of primary atrophies.

The ureter on the operated side showed but little change in the dogs that lived only a few days; in all of the others (except the two described above in which general renal atrophy occurred), the diameter was increased from two to ten times normal and the walls were rather thin. In all of the dogs (also guinea pigs and rabbits, except the rabbit kidney shown in Fig. 5) the urinary sacs, ureters and kidneys were filled with urinary fluid which was not under tension.

Peritoneum, Retroperitoneal Tissues and Abdominal Wound.—Inflammation of the peritoneal membrane occurred in three of the dogs; in one it was mild; in one, purulent; and in one, diffuse. The other dogs were normal in this respect, except, of course, that the peritoneum was involved in the adhesions formed around the point of division of the ureter. The retroperitoneal tissues were normal in all of the dogs except the two in which urinary sacs were formed in this location. Infection of the abdominal wound occurred in five dogs, but only the skin and subcutaneous tissues were involved. These infections were due mostly to the fact that dogs lick and scratch their wounds and tear them open. Rabbits and guinea pigs do not molest them and hence have but little trouble in this respect. Gross signs of infection in the tissues near the urinary tract were not usually present, although numerous bacteria could be found nearly always in the fluid in the urinary sacs, ureters and kidneys.

SUMMARY

(1) The mortality in the writer's animals was 75 per cent; the average of other investigators, 61 per cent. The death rate was highest in the guinea pigs (100 per cent), less in the rabbits (78 per cent), and lowest in the dogs (63 per cent). These results contrast with those of Barney,[1] who found the smallest death rate in herbivora. It is evident, therefore, that complete division of the ureter is an exceedingly grave occurrence, but not necessarily fatal. As compared with ureteral obstruction, it is decidedly more serious; the mortality in the writer's experiments on ureteral ligation was 69 per cent. The added danger from an opened ureter is due mostly to the toxemia from absorption of decomposed urine from the tissues outside the urinary tract; for of course absorption from these loose structures is greater than through the uretero-renal epithelium. Probably the mortality of this accident in human beings is not so great as in animals on account of the impracticability of giving to the latter as good care as to the former.

(2) The chief symptoms in the writer's animals were anorexia, weakness and diarrhea. Most of the animals were quiet the greater portion of the time. These symptoms are about the same as those found by other investigators except that they observed convulsions and coma rather frequently.

(3) The most striking feature of our experiments as well as those of other investigators is the activity of the tissues in the vicinity of the severed ureter in preventing the spread of the escaping urine. In some instances the reaction is so prompt that the ureteral opening is sealed at once.

More frequently a urinary sac is formed by adhesions between the intestines, omentum, bladder and body wall. This urinary cavity may contract and be obliterated or may remain unchanged indefinitely or may increase in size; also secondary sacs may develop from the original one. Limiting adhesions occurred in all but one of the writer's animals.

(4) The amount of infection in the peritoneum (21 per cent), retroperitoneal tissues (13 per cent) and abdominal wound (15 per cent) was surprisingly small in all of the writer's animals. Other experimenters have not been so fortunate; they have had from 25 to 33 per cent of infections in these locations.

(5) The effects of this operation on the kidney and the ureter are the same as those of complete ureteral obstruction if the animal lives long enough except that the results develop more slowly in the former; also in ureteral division there is the added feature in about 50 per cent of the animals of the formation of a urinary cavity at the point of division of the ureter. During the first two or three months after complete severing of a ureter it gradually dilates and the kidney suffers cystic enlargement. After three or four months dilatation still continues in more than half of the animals, while about 44 per cent of the writer's specimens show more or less marked general renal atrophy (decrease in size) on the operated side. A kidney in this reduced and quiescent state is, of course, entirely harmless to its possessor.

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DISCUSSION

Dr. L. F. Turlington, Birmingham, Ala.—The fact that a cut ureter left free in the abdominal cavity did not kill any of the animals, is very comforting to those who do surgery. The symptoms presented by the dogs, the anorexia and so forth, might be a hint to us in diagnosing the trouble in the human, and I think that if we apply this to our own work we may get something out of it. It is very comforting to me to think that if I should cut a ureter in two the patient might get well, or that he stands a 37 per cent chance of doing so, even in the event that the trouble is not diagnosed.

Dr. M. Y. Dabney, Birmingham, Ala.—In human beings a severed ureter usually occurs in the female following pelvic operations. It most often occurs in cases of fibroid of the cervix, which destroy the normal relationship. They are often associated with hemorrhage, and the patient may be in *extremis* and in no condition for more surgery.

There are about nine possible things to do when a severed ureter is discovered. If the condition is extreme one might put in a drain and do nothing else. Another thing is to bring the ureter to the surface and allow it to drain. The third thing is a ureteral anastomosis. Another method of treatment is an anastomosis into the cervical stump in cases of hysterectomy, and next into the vaginal cuff or into the sigmoid. A nephrectomy may be performed, as one of my colleagues has done, at the same operation.

The uretero-ureteral anastomosis or the ureterovesical anastomosis and the ligation deserve attention. A few years ago in the East it was shown that when a ureter is cut, if an anastomosis is performed a stricture will follow, and that the benefit is of very short duration. Following that a few men began simply to ligate cut ureters and were successful in the absence of infection of the kidney.

Transplantation into the bladder is more apt to take than any other sort of repair if the severance occurs reasonably near the bladder, but so far as I can learn this always results in a huge dilatation of the ureter. Whether this is due to scar tissue formation around the site of the anastomosis, I cannot say, but the ureter becomes enlarged and infection follows.

Dr. Jones (closing).—Dr. Turlington seemed to take too much pleasure in the fact that the patient would not necessarily die if one of her ureters were cut. I purposely avoided that statement, for I did not wish to bring out anything that would give anyone comfort if he should allow this accident to happen.

Dr. Dabney spoke of obstruction of a ureter leading to dilatation of that ureter and its corresponding kidney. This was one of the results I discovered in my experimental ligation of the ureter. If the animals survived the first stages of this procedure, in about 50 per cent of them the ureter on the side where the ligation had been done became reduced in size, sometimes primarily, sometimes secondarily, and the kidney became smaller, assuming a condition which was harmless to the individual. A rather large number of such cases have been reported in human beings. If we could experiment with the human we probably should find that in a considerable proportion of cases the kidney and the ureter on the ligated side would finally take on an atrophied and harmless state. The surgeons at the Mayo Clinic were among the first purposely to ligate a ureter as a means of disposing of the corresponding kidney when its ureter was irrevocably damaged. This has now become almost a standard procedure in such emergencies. If the patient, who nearly always is a woman, gets through the first stormy period, and she has about a 50 per cent chance at this stage, she has about another 50 per cent chance that finally the kidney will become reduced in size and remain harmless indefinitely.

FURTHER EXPERIENCE WITH SYNERGISTIC ANALGESIA*

By G. T. Tyler, Jr., M.D.,
Greenville, S. C.

Synergistic analgesia, induced by the combined action of two or more drugs, was made use of by Gwathmey and Greenough; and the results of their work appeared in the *Annals of Surgery*, August, 1921. They used magnesium sulphate, 25 per cent solution subcutaneously, in 30 to 50 c. c. amounts. This was diluted to 300 to 500 c. c. with sterile water before being given. Morphia in gr. 1/8 doses was given hypodermically at twenty to thirty minute intervals for two or three doses. Both were given one or two hours before operation. The results of their work were so convincing that their method was soon adopted by other clinics. They concluded that in the analgesic state patients were put to sleep with much less anesthetic, had little or no excitement, and were at all times pink. In addition, the post-operative course was smooth, morphia being required at longer intervals and in much smaller amounts.

After reading their paper, I began using synergistic analgesia, and have tried it in nearly 100 cases. My experience has confirmed the opinion of the authors mentioned. I have not made use of nitrous oxid-oxygen. Ether and occasionally novocain were the only anesthetics used.

By the time the patient reached the anesthetizing room he was apparently not interested in what was going on, and the anesthesia was induced without excitement. It was noted also by the anesthetist that less ether was required, and that it could be discontinued sooner, the patient often requiring none during the closure of a thick abdominal wall. Furthermore, in the post-operative course the patients had less nausea, less pain and distension, and required smaller amounts of morphia. This was not an invariable rule, but it was so noticeable that the nurses spoke of it, and the records bore out their testimony.

In continuing this work, I found one patient with senile gangrene under whose skin I hesitated to put Epsom salt, although there had been no sloughing or abscess following its use. Hence it was given per rectum, the morphia being hypodermic. The analgesia obtained in this case was so satisfactory that I ran a series of cases in which the magnesium sulphate was given only by rectum, and was convinced of its analgesic effect from the conduct of the patients in their anesthetic and post-operative course. One ounce was dissolved in four ounces of water and slowly injected after the patient had been given and expelled two enemas. This was given one and one-half hours before operation. At the same time, morphia was given in gr. 1/8 doses hypodermically at one-half hour intervals for three doses.

At that time I knew of no other work in which magnesium sulphate had been given per rectum. Dr. Gwathmey, in a letter received some weeks ago, said that he had the records of over 200 cases where it was used by rectum. His dosage is 8 gms. (120 gr.), combined with ether, oil, glucose, acacia, morphin and paraldehyde. Chloretone is also occasionally given by mouth or by rectum in association with the other drugs.

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The absorption of magnesium sulphate interested me, but I could find little information on the subject. Dawson and Goldschmidt had demonstrated that there was practically no absorption of sulphates from the large bowel. Dr. Goldschmidt suggested that a quantitative estimation of the sulphates in the urine might determine the question. Dr. David Smith made these tests for me, but found that the increase in urinary sulphates was so little as to be negligible. On the other hand, it was found by St. George, working in the Jersey City Hospital, that the magnesium in the blood was increased from 3 to 4 mg. per 100 c. c. of blood (the normal content) to 9 to 10 mg. in the first hour after 8 gm. had been put into the rectum. It gradually returns to normal in four or five hours.

How the magnesium acts is not known, but it is thought by Gwathmey that it holds the morphin in contact with nerve tissues for a longer period than if the morphia is used alone. Rector states that magnesium sulphate aids in absorption of the morphia and retards its oxidation in the body. Following Gwathmey's suggestions, he induced "colonic" analgesia. When later the anesthetic is given, it is discontinued immediately upon the loss of reflex sensation and muscular relaxation. Five variations of the method of inducing analgesia are given by Gwathmey, all of which include morphin and magnesium sulphate; but in no others is analgesia produced to the degree obtained by the subcutaneous method. My experience corroborates this statement. In some cases one can hardly say from the course of the anesthetic whether the magnesium sulphate had been given by rectum or under the skin; but in a series of cases the average is certainly in favor of the hypodermic use. It is not so convenient to give when much is to be done in the last few hours before operation. It causes pain also, unless novocain is given with it. I have not used per rectum ether, paraldehyde nor chloretone with magnesium sulphate as Gwathmey has done. I think, however, that these are excellent adjuvants, especially paraldehyde. Probably subsequent efforts will bring about better analgesic effects and make the results of rectal administration better than those already obtained. The simpler method of rectal injection warrants a trial.

Measures to insure a quiet, unexcited anesthesia, a smaller amount of the anesthetic, less post-operative pain, distension and nausea should appeal to surgeons. And when the likelihood of shock is much reduced, a further advantage is gained.

The method is not one in which less vigilance can be permitted. There are dangers to be avoided. Magnesium sulphate affects the respiratory centers in the medulla. If respiration becomes embarrassed, calcium chlorid intravenously will immediately counteract its effect. Gwathmey advises intravenous use of large amounts of salt solution; also the rebreathing of the expired air, the patient's own carbon dioxid stimulating his respiratory center. Cyanosis and loss of lid reflex are to be avoided. The patient must be pink throughout the anesthesia.

A study of one's cases will often take away enthusiasm for any special procedure. An occasional patient had no magnesium sulphate before operation and required no morphia afterward; but these are few. Only a large series of cases can furnish conclusive data.

For post-operative pain I have combined morphia with magnesium sulphate, 2 c. c. of the 25 per cent solution. While the number of patients so treated is not large enough to draw definite conclusions, my impression is that morphia combined relieves pain for longer periods than when used alone.

From my experience with synergistic analgesia, I believe it can be safely stated that:

(1) The excitement stage of anesthesia is much lessened, if not abolished.

(2) Less anesthetic is required, and shock from the operation occurs less frequently.

(3) Post-operative pain, distension and nausea are much reduced.

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DISCUSSION

Dr. Frank D. Smythe, Memphis, Tenn.—Since Dr. Gwathmey's report of his experience with magnesium sulphate, August, 1921, in the *Annals of Surgery*, I have employed the method described, modified somewhat, in all of my work, except when operating in the country or at some point where it was impossible to obtain a freshly prepared solution of magnesium sulphate.

The benefit of synergistic drugs is known and appreciated by all surgeons and used by most surgeons, though we sometimes see a surgeon who refuses to give a hypodermic of morphin or any other analgesic before an operation. We use synergists in our work for the reason that such drugs lessen the danger of the inhalation anesthetic, diminish its amount and enable us to perform the operation safely and successfully.

There is some risk, slight though it may be, in all inhalation anesthetics. This risk is decreased in keeping with the experience and competency of the one administering the anesthetic. I use gas-oxygen preceded by synergistic therapy, consisting of morphin sulphate, two or three doses, depending upon the size, sex and temperament of the patient, administered at intervals of twenty minutes, dissolved in a 25 per cent solution of chemically pure and freshly prepared magnesium sulphate. With the second dose I administer a 1/150 of a grain of atropin sulphate. Atropin is synergistic to morphin as an analgesic, but is physiologically antagonistic to morphin in its effect upon the respiratory center. Hyoscin and scopolamin are identical chemically and physiologically and are synergistic to morphin as an analgesic and as a respiratory depressant; and I think it is unsafe to combine these two powerful depressants, morphin and hyoscin, and administer them prior to the administration of an inhalation anesthetic.

I wish to record my favor of the use of atropin as a routine combination with morphin and my opposition to the use of scopolamin in combination with morphin. It may be used by men more experienced than I, but for the reasons submitted I would not use the combination.

I have operated upon over two hundred cases during the past year, using this technic in practically all cases. Most of the cases were abdominal and pelvic surgery, but other major operations are found in the list.

Almost every one upon the eve of an operation suffers from fright. This may at times be a complication of importance, and it must be controlled or removed whenever possible. The method described by Dr. Tyler in his paper has been used by myself for the past year or more, and has proven very successful.

The cooperation of every one who participates in the preparation of the patient for operation and of those assisting in the operation is necessary. An interne or a super-wise nurse may do much harm by volunteering opinions as to the wisdom of the method. It is best for the surgeon, where such lack of discipline obtains, to conduct the treatment himself or have his assistant or special nurse do so.

The first dose of morphin, one-eighth of a grain, is ordered administered one hour and a half before the time set for operation and is repeated every twenty minutes until three doses have been given. In the second dose, atropin is added to the morphin. In one hundred cases I used the larger amount of the solution as recommended by Gwathmey, namely, 200 to 400 c. c. of a 4 per cent solution given subcutaneously. Results were compared with a similar number of cases where the morphin was given in 2 c. c. of the 25 per cent solution, and the record showed that the analgesic effect of the morphin was not prolonged in the cases where the larger volume of the solution had been given further than was accomplished by the morphin given in 2 c. c. of magnesium sulphate alone. As the administration of the larger volume of the solution is somewhat painful, and some patients seriously object to it, we have discontinued the use of magnesium via hypodermoclysis, depending upon the use of morphin dissolved in 2 c. c. of a 25 per cent solution.

Patients thus prepared enter the operating room without apprehension or misgivings concerning the operation and its outcome. The amount of nitrous oxid necessary is reduced from 40 to 60 per cent, and the oxygen content is increased. In 50 per cent of our cases we found it necessary to use an amount of ether varying from one to six drachms. The cases requiring the addition of ether were usually gall-bladder or stomach cases. The anesthetist found it advisable to supplement the gas with ether and did so without consulting me.

The cooperation of the anesthetist and the surgeon is essential. Upon withdrawal of the nitrous oxid when the last sutures are being introduced and substitution of oxygen, it is found that the patient awakes just as the dressing is completed. The patient remains pink throughout the operation, the pulse varies from 80 to 90, being usually 84, and the post-operative progress is more smooth and much more satisfactory in cases operated upon prepared thus than when operated upon without synergistic drugs.

Novocain should be used within and under the skin in the deep fascia and the peritoneum.

Such a policy enables the surgeon to begin the operation before the patient reaches the stage of surgical anesthesia under the inhalation anesthetic.

Dr. John Darrington, Yazoo City, Miss.—The public is more interested in the going to sleep than in the operation. For that reason the local anesthetic has been accepted readily by the public. A great many people are willing to have an operation performed when they know it can be done without their going to sleep. A few years ago chloroform was used almost entirely by the surgeons of the South. We discovered that it was more or less a dangerous drug, whose mortality rate was too high. It required a large amount of skill to administer chloroform safely, and we selected ether, because it was safer in the hands of men unaccustomed to giving an anesthetic. We have gotten along well with ether, with a very low mortality, but we should have trained men to administer anesthetics, whatever they are. That is a great need in hospitals today.

A skilled anesthetist should be employed as well as a skilled surgeon.

Dr. Bertram H. Wagnon, Atlanta, Ga.—A little more than a year ago, following the paper by Dr. Gwathmey on synergistic anesthesia, we started using the salt, chemically pure, in giving morphin to patients. At the Infirmary we gave the morphin from ¼ to ⅛ grain and rarely had to give more than one hypodermic of morphin after an abdominal operation. Where we had been giving ¼ grain morphin and 1/150 atropin preceding operation we cut the morphin to ⅛ grain in 2 c. c. of magnesium sulphate solution. The nausea was noticeably absent after ether anesthesia. We used ether in all these cases, and while the patients reacted no sooner, they were more comfortable after the reaction. Whether the synergistic action of the magnesium sulphate was responsible for the reduction of nausea, or whether the reduction of the morphin was responsible, I have not been able to decide, but certainly the patients have been more comfortable since this method has been used. It is now done as a routine in the Dispensary. All the morphin is administered in a solution of magnesium sulphate.

Magnesium sulphate in local work with novocain has also proved satisfactory because the anesthesia lasts a much longer time. When the anesthetic effect of the novocain wears off the magnesium sulphate solution carries the anesthesia on for a much longer time. We found that if we did a local at 9 o'clock in the morning, sensation did not return until 3 in the afternoon, and the patient complained of no pain in the meanwhile. In one case where we used a 1 per cent solution of novocain in a 25 per cent solution of magnesium there was a slough at the line of suture when I injected a foreskin. However, it finally healed by granulation.

Dr. C. N. Cowden, Nashville, Tenn.—If you have trouble with ether it is because the anesthetist does not know how to give it. An expert should use not more than a third or half a can of ether, and from this the patient will have no bad effect. If too much ether is used the patient will be in shock for a long time and will vomit every time he comes out.

Morphin is the best thing in the world as an aid to ether anesthesia. It stops peristalsis in abdominal operations, and I have never understood why any one will fail to give his patient a comfortable twelve or fifteen hours with it.

The synergistic use of magnesium sulphate is of benefit, perhaps, but it is painful, and a few times I have seen sloughing, as the previous speaker said. In closing the wound the injection of a solution of novocain into the fascia is of assistance.

It is difficult to close the abdominal wall after an upper abdominal operation, but if the injection is used the anesthesia will last all the time and there will be no difficulty in bringing the wall together. We sometimes have trouble in healing our wounds with this solution in them. That is the only objection to using local anesthesia with the general.

We lost two patients with ether in the operating room in Nashville in one day because of the wrong administration of the ether, but we also hear of deaths under this new method. It must grow with the young men.

Dr. Tyler (closing).—I can only say that I would like you to make further use of this method. There has been little written as yet upon this method except what Dr. Gwathmey contributed in the last year to the *Annals of Surgery.* He has an article also in the *American Journal of Surgery,* October, 1922. If you will look over the detailed case reports, you will be convinced that there is virtue in the method and find it very simple. In obstetrical work it should be of much value. In the reduction of fractures I believe that many times the use of magnesium sulphate and morphin would almost obviate the need for general anesthesia, though I have not yet made use of it in this way. A short time ago a colleague told me that he had to care for a patient with an inoperable cancer of the uterus, and found that by combining magnesium sulphate with morphin he was able to cut down the morphin to a great degree and carry her along to her death with little discomfort. We are taught that nausea from the use of morphin occurs upon recovery from the morphin. If we can give less morphin to relieve pain, I see no reason why we should use more.

THE UTERUS IN MALPOSITION*

By Francis Reder, M.D.,
St. Louis, Mo.

There will always be an interest attached to a uterus in malposition on account of the selective treatment necessary for each individual case. A patient can only be given the best treatment when the gynecologist, familiar with the normal and abnormal conditions of the pelvis, makes a careful study of the existing lesion, and selects the treatment which in his judgment will prove most beneficial.

The evolution of technological progress in gynecology has been so rapid since the aseptic era in surgery has minimized the dangers of abdominal operations that the scalpel is virtually the master in gynecological treatment today. So far-reaching has become the horizon of the surgical measures that a graduate in medicine at the present time possesses a good knowledge of gynecologic surgery, but a rather vague understanding of any gynecologic methods in vogue at an earlier day.

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*Read in Section on Obstetrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Much of the work of our forefathers engaged in the practice of gynecology has become obsolete. There are, however, a few things left that fit into our present day practice which the gynecologist regards with the exalted consideration they deserve.

The more we advance in years the greater becomes our respect for our predecessors. It is with no hesitancy on my part, but with a feeling of interest, that I speak of the pessary as an aid in affording relief of the symptoms caused by a uterine malposition. Naturally, the question arises to what extent in our present knowledge of uterine deviations is the pessary a beneficial factor, and what advantages, if any, does the appliance possess over an operative measure?

In all uncomplicated displacements where the perineum is intact, a properly fitting pessary will relieve the symptoms in the majority of cases. It is the simplest method of treatment and with proper care is free from danger.

The pessary possesses no advantages over an operative procedure, as it is only a temporary measure aiding Nature in an endeavor to restore the tone of the tissues and induce a return to normal conditions. A surgical operation institutes a direct attack upon responsible structures in the hope of obtaining a more definite result.

There are, however, patients demanding relief from their suffering whose general condition contraindicates any surgical procedure. These are the old and decrepit; those with decompensated cardiac disease; and those with diabetes or advanced renal lesions; patients with pulmonary affections for whom an anesthetic would prove very dangerous; and there are also the timid ones. It is true much can be accomplished in present day surgery with spinal, sacral and local anesthesia. However, the fact must not be overlooked that the stage of surgical convalescence is in itself a serious factor and must be reckoned with.

It is in this class of patients that a pessary will often bring great relief and improve the general well being.

There is another class of patients in which the pessary fulfills an equally efficacious influence. In this class we find the retrocessed pregnant uterus which by its growth has become wedged below the promontory of the sacrum and is unable to free itself. The condition is of particular interest to obstetricians who will recognize that all is not right by the unusual vesical irritation, sensation of weight and pressure in the pelvis, pain in the back, and constipation. A manual examination readily discloses the condition, which demands immediate attention. The reposition, if no undue delay has been permitted since the onset of the symptoms, is usually not difficult. There may be conditions, however, when the patient will have to be anesthetized and reposition attempted in the knee-chest position.

After the gravid uterus has been freed, and before the third month of gestation, it will be prudent to introduce a Hodge pessary to forestall any tendency to relapse. After the fourth month the womb is of such size as to be retained in the abdominal cavity without difficulty, and the pessary can be removed.

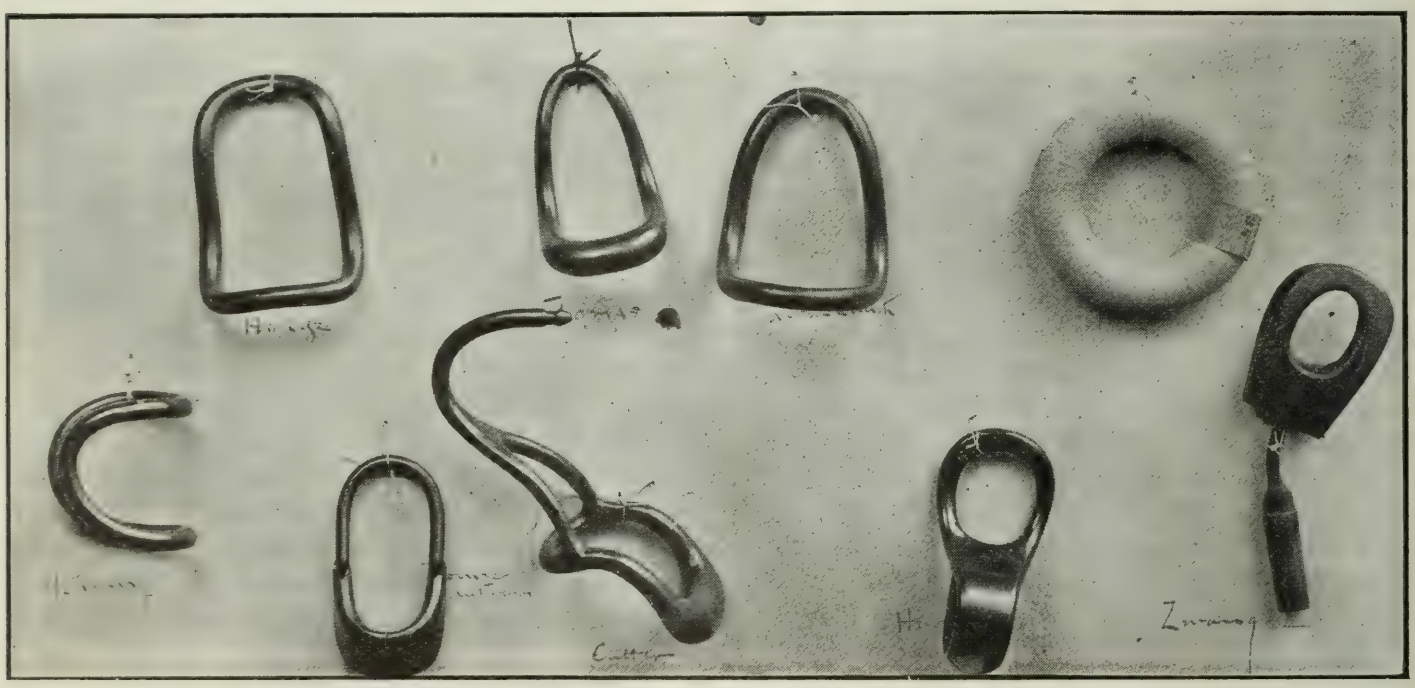
It is well to bear in mind that a retrocessed uterus, having fulfilled its physiological function, will involute in the retroverted or retroflexed position. Consequently it is advisable to insert a Hodge or Smith pessary to be worn for a few months to enable the uterus to be molded in the normal position during involution.

The response from an involuting uterus when supported by a pessary and subjected to hot vaginal douching is most gratifying.

All supporting structures of the uterus are muscular and in a physiological sense are adnexa. They evolute with the uterus during pregnancy and they involute with the uterus during the puerperium. If these structures are allowed to involute during the puerperium with the uterus in a retroverted or retroflexed position, an irremediable harm will befall these structures. They will become relaxed and suffer such loss of tone that they will be wholly inadequate to sustain the uterus in its normal position.

Recovery from this partially subinvoluted condition is only possible when the uterus is replaced, raised and held in an extreme forward position by a pessary. Both special care and skill are required in the care of a uterus whose tendency is to

retrovert during the puerperium. For such cases the pessary possesses an appreciable value. A subinvoluted retroverted uterus should, shortly after the lochia has ceased, be brought into anteversion bimanually and secured by a properly fitting pessary. Such a pessary must of necessity be rather large. As involution progresses and the structures, particularly those of the vagina, are gradually returning to normal, it will be found that within a week the original pessary will have become too large and that a smaller one must be substituted. At the end of a fortnight the contraction of the vagina will be such that the second pessary will have to be displaced by a still smaller one. After a few more weeks the third pessary will have to be supplanted by one of still smaller size. This staging with different sized pessaries, together with the hot vaginal douching, will secure an effective puerperal involution and usually a cure for the retroversion.



Vaginal pessaries.

As an adjunct to the woman who is in the child-bearing period, and who is in need of an operation for a retroverted uterus but declines because her family has not been completed, the pessary proves a satisfactory service. Such women not infrequently wear a pessary for many years except when pregnant, usually having it replaced a few months after childbirth and wearing it until well advanced in the next pregnancy.

We have all met with the so-called physiological vomiting during the early months of pregnancy, and we have seen such vomiting become sufficiently persistent or distressing to demand treatment. It should always be borne in mind that a so-called physiological vomiting may become a hyperemesis through neglect. In all cases when the act of vomiting appears to be unusually severe, a vaginal examination should be made to determine the position of the uterus. If this organ is found to be in malposition it should be corrected manually and a properly fitting pessary inserted. The assumption that such vomiting is to a considerable extent of a reflex nature induced by uterine irritation is supported by the relief obtained after the correction has been made. In such cases the pessary is to be worn for several months, or at least as long as there is a tendency to vomit.

It has been my good fortune to relieve in this manner quite a few patients from this distressing condition after other means (lavage, medication, etc.) had failed. Such experiences have imbued me with a very kindly feeling for this appliance.

Deviations of the uterus usually met with in gynecologic practice are either for-

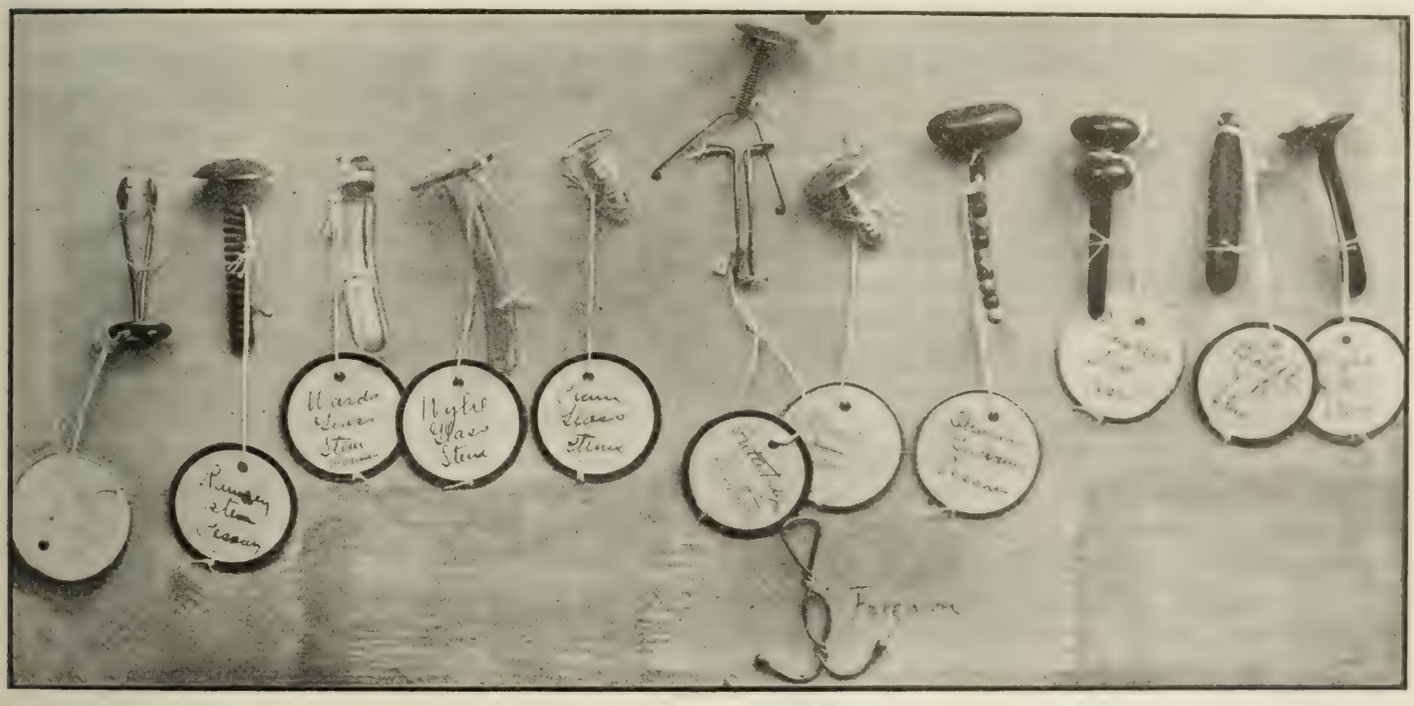
ward or backward displacements with or without a flexion, and the descensus of the first or second degree. These displacements are generally recognized by the symptoms they produce, or are discovered during a vaginal examination when the clinical picture in some vague manner suggests a pelvic trouble.

An uncomplicated version is not a serious lesion and is often free from symptoms. However, a woman with an abnormally placed uterus is always more liable to inflammatory attacks from slight exposures than if her organ were in a normal position. Most of these women have backaches and uncomfortable catamenia, and sooner or later are obliged to seek relief. The important fact must not be overlooked that in such a condition an ever-present passive hyperemia, frequently associated with active hyperemia and in itself a cause of subinvolution and hyperplasia, renders tissues vulnerable to slight causes of inflammation and makes an inflammation more obstinate when once excited.

In all uterine displacements a diagnostic refinement and a skill of high order is imperative so as to identify and differentiate properly an existing lesion.

The general health of the patient and the physical make-up must be carefully scrutinized. If there is any manifestation of visceral ptosis, it should be noted whether slight or marked. General symptoms help us but little further than to direct us to the necessity of a manual examination, which latter may or may not give definite information of the existing lesion. A flexion is often more easily diagnosed than a version, because in the former the curve or bend of the uterus enables it to be followed in the vagina with ease.

Should additional information be desired recourse to the uterine sound will become necessary. The uterine sound is an innocent looking instrument; however, in the unskilled hands of an inexperienced physician it can do a great deal of harm, and should therefore be used with conscientious caution.



Intrauterine pessaries.

The treatment of the majority of uterine malpositions, even when conditions have not reached an extreme stage, is today mostly by surgical operation.

It is my conviction that many uterine displacements do not require surgical measures for their relief, and that a correction can be accomplished by a less drastic measure with equally gratifying results. From this class must of necessity be excluded deviations the result of inflammatory complications, neoplasms, or abnormalities in the supporting mechanism which predispose to displacement, and

which will predispose to their recurrence unless they are corrected by operation.

In referring to the less drastic measure, I speak of the pessary. This appliance is undoubtedly well known to you. Perhaps many of you have forgotten it, or have become prejudiced against it because you did not obtain satisfactory results. Perhaps you thought the appliance might be harmful. Perhaps you did not take sufficient interest to acquaint yourself with its mechanics and technic, or possibly you may have been influenced too favorably by the operations of the present day for these conditions.

It is true an operative measure is perhaps the quickest remedial way in dealing with a malposition, but let me say to you that it is far from being settled that this preference is judicious, sound and necessary.

Treatment with a pessary is often disappointing and versions are met with where a pessary has been very ineffective. Such a version is the anteversion. Although a great variety of vaginal pessaries have been devised for the treatment of this version, it is only exceptionally that mechanical treatment has been found satisfactory. Of the more useful type I may mention the Gehrung pessary, an efficient appliance for the relief of anteversion with associated cystocele. In influencing an anteversion it is obvious that the fundus of the uterus can only be directly elevated by means of pressure transmitted through the bladder. Such a transmission of pressure may more often do harm than good.

The Gehrung pessary requires a studied technic for its insertion. Presumably this accounts to some extent for its lack of popularity.

Inasmuch as an anteversion is generally an indication of increased weight of the fundus uteri, satisfactory relief has been obtained by the insertion of a Hodge pessary or a Meigs elastic ring. The beneficial action of these pessaries exerts itself by elevating the whole uterus and limiting its mobility.

In looking at the complicated anteversion pessaries originated by Thomas, Hewit and Barnes, one cannot help appreciating the deep concern these gynecological masters entertained for this version.

Frequently a flexion is combined with an anteversion. Whether or not this flexion is pathological can only be determined through diagnostic finesse. Suffice it to say that before the age of puberty some flexions are common and are considered normal. When in after years the uterus reaches its full development and becomes firmer, such flexions straighten themselves. There are, however, anteflexions that are pathological, especially those that are acquired. These flexions frequently tend to produce obstructive dysmenorrhea, and probably also sterility.

In instituting a treatment for an anteflexion, even of moderate degree, the reasoning powers of the gynecologist are severely taxed. Vaginal pessaries are useless, and so are the dilatators and metallic bougies, or the various plastics on the cervix. There is a form of treatment, however, that has given good results; on account of its dangers, however, its use is not to be recommended to those who have not given it special study. I have reference to the intrauterine stem pessary. It is the most effectual means of straightening an anteflexed uterus and of causing relief of symptoms.

Special precautions are required in applying an intrauterine stem pessary. Aseptic measures must be respected and the uterine canal carefully prepared for the introduction and this is often a painstaking piece of work, especially if the patient is a nullipara or unmarried.

Like the vaginal pessary, they are to be used not as a permanent support but as a temporary one to be worn for a limited number of weeks or months. During the time a patient is wearing a stem pessary she should be carefully observed. A mucous surface covered by cylindrical epithelium is not likely to tolerate pressure and friction altogether with impunity and may resent the intrusion of such a foreign body. An irritation evidenced by pain and a rise of temperature demands prompt removal of the stem. The selection of a stem pessary calls for excellent judgment, and it will not be long before it will be known whether or not the selection has proven a good or bad one.

Special precaution is necessary as to the length of the stem. It must be neither too

long nor too short. According to measurement it should be at least one-half inch shorter than the uterine cavity. The material of which the intrauterine pessary is made, the thickness of the stem, and the style of the appliance must also be considered in making a selection. My preference rests with the annealed glass stem without a vaginal disc. The vaginal disc is supposed to keep the stem in place, and is often a source of irritation to the vaginal wall and cervix. However, I can say that no stem remains in place, except the pessary of a Chambers or Carstens type, having spreading stems. All other pessaries will be gradually forced out of the uterine canal and into the vagina unless they are sewed to the cervix. This can be readily done with bronze wire by piercing both the anterior and posterior lip and securing the wire ends with perforated shot.

The bronze wire is used as a sanitary measure. It is pliable as twine and does not become foul from absorbing the secretions. The thickness of the stem should be such that it is freely movable within the uterine cavity.

It is well, however, before a stem pessary is secured by suture simply to introduce and support it with a special vaginal tampon to test the uterine tolerance. If, after a week, nothing of an untoward nature occurs, the pessary can be secured in the manner suggested.

Probably the most successful usage of the vaginal pessary is in the relief of symptoms the sequence of a retro-deviation, in maintaining or modifying the position of the uterus. A retroversion is the most frequent of the uterine malpositions. It is a common ailment with women who have given birth, whose care during the involuting period of the uterus, usually the first six months after the birth of the child, has for some reason been neglected. Retroversions are occasionally met with in nulliparous women, the causation being chiefly of a nutritional and developmental character. It may, however, be the result of a fall.

The symptoms that usually present themselves are common to most uterine maladies, being due to associated hyperemia, endometritis and metritis. Prominent is the dull, heavy headache, the bearing down sensation occasioned by a beginning descensus, vesical irritation and rectal tenesmus. Should a flexion be associated with a version, the symptoms may be aggravated and cause great suffering, especially during the menstrual time, when the exit of the fluid and mucus is rendered less free.

The first indication for a retro-deviated uterus to be subjected to a pessary support is to restore the organ to its normal position, provided there are no adhesions binding it down and preventing replacement. This may be generally and effectively accomplished by placing the patient in the semi-prone position, or better still, by resorting to the genu-pectoral position. The index finger is then introduced per vaginam and the posterior wall of the passage pulled backward so as to allow atmospheric pressure to come into play. This will usually suffice to reduce the displacement. If a flexion has been associated with the version, the reposition of the retrocessed uterus will permit the coils of small intestine to again fall into the retrouterine fossa of the peritoneum, where they may exert a part of their function by pressing chiefly upon the posterior surface of the uterus, thereby tending gradually to reduce the flexion.

A retroverted uterus brought into an anterior position can be successfully supported by a properly fitting pessary. Of these pessaries there are a great variety—a few, however, will answer all purposes. They are principally the Hodge, Thomas and Smith. To be able to select a pessary which will satisfactorily meet the existing conditions is an accomplishment that can only come from an extensive experience, and mastered by those who can readily appreciate technically mechanical facts.

A pessary is a sort of a lever, a splint if you please. When in place it should not over-distend the vagina. It should not rest against the pubic rami or any bony support, but should be held by the elastic walls of the vagina. It should be possible to pass the index finger easily between the pessary and the pubes, and the patient should be unconscious of its presence.

If a flexion is superimposed on a retro-deviated uterus, a not uncommon occurrence, and remains obstinate as can be

elicited by the symptoms, the treatment by stem, similar to that described in anteflexions, will often prove efficacious. This does not mean, however, that the vaginal pessary can be discarded. The uterus must be supported in its antepoise.

There is another malposition I wish to speak of, mainly on account of the minor importance attached to it. It is the uterine descensus, not the extreme state of prolapsus, but the degree without appreciable displacement of the uterus. This condition is not uncommonly met with in multipara and is often the result of general laxity and weakening from malnutrition of the structures sustaining the uterus at its pivotal point. The severer forms with hypertrophic elongation are usually the outcome of neglected minor degree prolapses, are associated with an extensively traumatized pelvic floor of long standing, and occur most frequently in multipara. Relief for this latter condition rests with an operative measure. A prolapsed uterus, not necessarily of an advanced degree, impairs the patient's comfort and capacity for exertion. Bladder and rectal irritation, pain in the back and loins, a sensation of weight in the pelvis and an annoying leucorrhea are the usual symptoms. It is a condition that will continue indefinitely unless relieved.

The recognition of a descensus in its earlier stages is sometimes not an easy matter. If the patient is examined in the semi-prone or in the lithotomy position, an existing prolapsus cannot always be satisfactorily demonstrated. It is when the patient is examined in the standing position that the correctness of the diagnosis can be ascertained more definitely.

The indications for the treatment of a descensus are two fold and are similar to those for the treatment of a retrodeviation. The first indication is to return the displaced organ to its normal position; the second indication is to retain it there. Reduction is usually accomplished manually without difficulty, and the genu-pectoral position will be of the greatest value. In those cases where the pelvic floor has not been robbed of its normal sustaining power, and no appreciable visceroptosis or the presence of a tumor can be demonstrated, the uterus can be sustained in its normal position by a properly fitting pessary. This form of malposition should receive the same judicious and exacting consideration when selecting a pessary as the other forms of malposition. It must be borne in mind that in reality four organs are to be supported, viz., the vagina, uterus, bladder and rectum.

In the moderate cases of descensus the pessaries that can be used with proper reserve and caution are Meig's elastic ring, Hodge's, Thomas', Hewitt's, Smith's and Galabins'. My preference has been for the elastic ring wherever applicable. It has given satisfaction in the greater number of cases, is easy of introduction, and possesses the advantage over the other pessaries that it cannot become displaced.

In conclusion, I may say that I fully appreciate the modern concept of treating a uterine malposition, and though I have spoken of the vaginal and intrauterine pessary with much mental reserve, knowing full well the present attitude of the gynecologist in regard to these supports, it cannot be denied that a pessary, either vaginal or intrauterine, is still entitled to a legitimate place in the treatment of uterine displacements.

DISCUSSION

Dr. T. S. Field, Jacksonville, Fla.—As I have grown older in practice I have found more need for pessaries than ever before. There are three conditions in particular in which I find the pessary invaluable. One is for retrodisplacement after a wasting disease such as typhoid fever. That is frequently seen in the nullipara. In this condition a properly fitting pessary which gives the ligaments a chance to regain their strength will cure the condition. In displacement due to post partum subinvolution of the uterus a pessary is invaluable as a cure if you have an adequate perineum. It is my practice to examine the patient on the tenth day post partum, and if the uterus is misplaced to insert a pessary to support it until involution has taken place. It is also my practice to have the patient report six weeks post partum to check up, and not infrequently I find retrodisplacement at that time which I had not noticed at the end of ten days. In these cases I always put in a well-fitting pessary. Lynch of California says that in 2000 cases he found 44 per cent of retrodisplacements following labor. These women are chronic invalids if we do not do something for them, in a large percentage of cases. Do not think that I say that all women who have retrodisplacement are invalids, because thousands of them have it without any symptoms. But if we put in this pessary with an adequate

perineum following labor, we can correct the condition entirely. But a pessary must be properly put in, so that the woman is not conscious of the fact that she is wearing it.

Backache is due to retroversion in a good many instances, but it is also due to chronic endocervicitis, and if we have retrodisplacement with a chronically inflamed cervix we must operate to cure the endocervicitis if we wish to cure the backache or we shall have cases with perfectly good position of the uterus still complaining of backache.

For the uterus in anteflexion, the pessary has been worthless in my hands. In most cases I found a return of the symptoms two or three months afterward. Also there is a chance of infection coming from the stem pessary, and almost 50 per cent of those who have dysmenorrhea have something in the abdomen which we did not suspect.

Dr. Edward Speidel, Louisville, Ky.—It should not only be the custom to examine women before they leave the hospital, but they should be examined three to six months later, because it will very often be found that cases that apparently were not retroverted at the original examination will show retroversion later.

A number of us have treated cases of hyperemesis in which we have found retroversion and have neglected to put in a pessary.

The stem pessary used in the uterus should be comparatively short, so that it goes just slightly beyond the internal os. Otherwise, if it is secured to the uterus by means of sutures, the uterus will force the stem down and the sutures will tear through the cervix, and you will have a bilateral laceration of the cervix.

Dr. E. T. Newsom, Sheffield, Ala.—My experience with pessaries of different types is only of three years' duration. They work in some cases if they are properly put in. Six months from the time I put in a pessary I remove it, and if the uterus returns to retroversion, I tell the woman it is no use to temporize any longer and advise immediately opening the abdomen and shortening the round ligaments. I take pains to see that the round ligament is firmly fixed in the inguinal canal. If the round ligament is attached to the uterus in its normal position anatomically, I do not bother it. If it is attached lower, I fasten the round ligament higher up on the fundus so that it will bring the uterus forward. I do the Crossen operation. An inadquate perineum is also repaired.

I wish to say a word in defense of the stem pessary. I see on the Doctor's chart there the one I have been using, the Baldwin glass stem pessary. The one I use is a straight glass rod, and they come in different sizes and lengths. The only objection I know to its use is that it stimulates the vascular supply to the uterus and adnexa and might light up some disease that is smoldering there. Careful bimanual examination will prevent this. It is as safe as dilatation or curettage, which are done often inadvisedly. Curettage of the uterus is good for nothing but to secure material for pathological examination. I do not think you will cure any disease of the endometrium in that way. Most of the cases of leucorrhea are endocervical in origin.

I have these stem pessaries in four women at the present time. They are doing what is claimed for them. I carry the pessary high up in the cervical canal and fasten it with a silver wire and split shot. I try to fix it so that it goes inside the uterus, but is far enough down from the fundus so that when the uterus does contract the fundus will not impinge upon the distal end of the pessary. The pessary is intracervical and intrauterine, and will stay in that position for six months if it be fixed with silver wire of proper size and if the correct length of pessary is selected.

Dr. Reder (closing).—I did not wish to be guilty of inflicting upon you some old, dug-up stuff. This subject is of considerable interest at the present day, and yet of course it is old. Hippocrates was the first to insert a pessary in the vagina. He died about 360 B. C., but the pessary is still used.

It is in the septic condition, in the toxic condition, where the body suffers eventually from a high degree of malnutrition, where relaxation of the structures takes place, where tissue tone becomes less, that our attention is called to various organs of the body.

A COMPARATIVE STUDY OF NEISSERIAN INFECTIONS IN THE MALE AND FEMALE URETHRAE*

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and
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We are often so engrossed in what we consider the great problems of surgery and medicine that we do not give sufficient time and thought to diseases of so-called minor importance. This has always been true of the profession's attitude toward infections in the male and female urethrae. Gonorrhea is considered a self-limited disease of minor importance. Some urologists, like the old Roman physicians, believe it beneath their dignity to allude to gonorrhea.

The minute structure and pathology of a diseased urethra is not generally under-

*Read in Section on Urology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

stood, and for this reason much misdirected treatment is applied to the gateway of the upper urinary tract. In no infection is it so important for the surgeon to have a thorough knowledge of the structural development and methods of diagnosis and pathology as in the common infections of the urethra. Symptomatology, pathology and treatment must be studied together. The closest cooperation and sympathy should exist between the clinician and pathologist. Not all discharges from the urethra, with many of the clinical manifestations of a Neisserian infection are gonorrhea, and in the subacute or chronic urethral discharge only the most skilled bacteriologist can name the offending organism, if a diplococcus is in question.

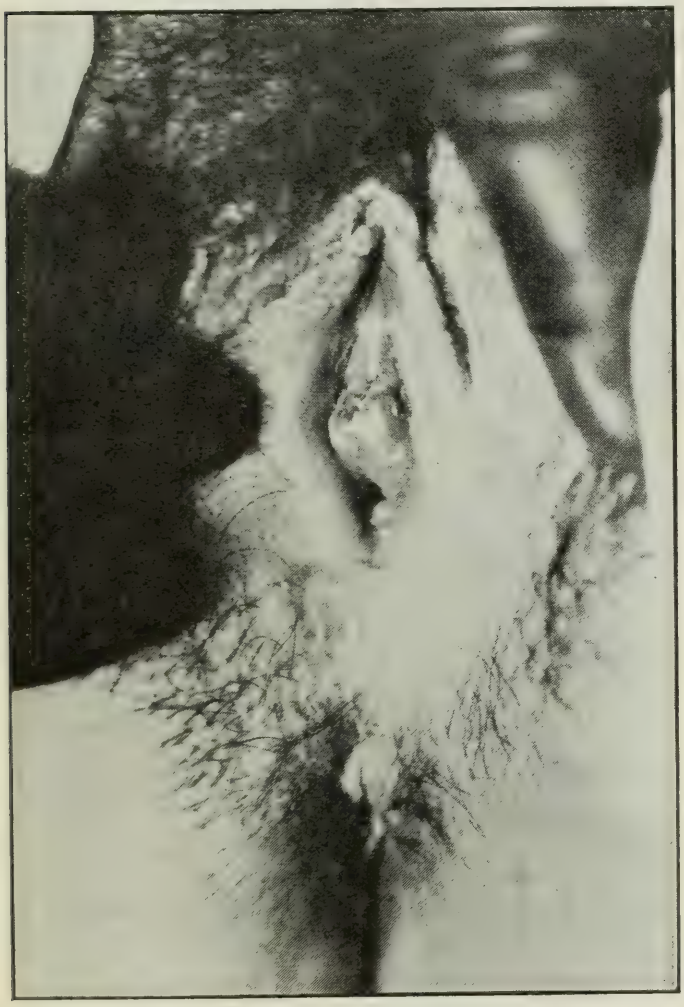

Fig. 1.—Case No. 1. Girl, age 18. Negative history. Infection of 18 months' duration. Clinical and smear diagnosis (four laboratories), gonorrhea. Our repeated cultures showed staphylococci and colon bacilli, but no gonococci.

Dr. Franklin P. Johnson,[1] of the Brady Urological Institute, by a series of wax reconstruction models of the male and female urethrae, has taught us much from a comparative study at various stages of fetal development. We are greatly indebted to him for allowing us to use some of his illustrations.

He demonstrates the entire homologue of the prostate in the female for the first time. He has shown that the female urethra corresponds to that portion of the male urethra lying between the vesicle opening and the prostatic utricle. Coincident to the formation of prostatic ducts in the male there appear similar glands in the female. The urethral glands in the female correspond to the prostatic ducts which lie above the orifice of the prostatic utricle. Skene's ducts are the homologues of the prostatic glands which lie below the orifice of the prostatic utricle. Bartholin's and Cowper's glands are true homologues. The practical teaching of this work should appeal to all. The growth

Fig. 2.—Another picture of Case 1, showing "creamy" pus massaged from Skene's glands, preparatory to making culture.

of the urethral glands in the female is retarded and in the adult they are fewer in number, not so close together, have thicker walls, fewer branches, and secrete less. The vestibule of the female corresponds to the remaining portion of the male urethra from the prostatic utricle outward. In dealing with infections in the female urethra, which is homologous to a

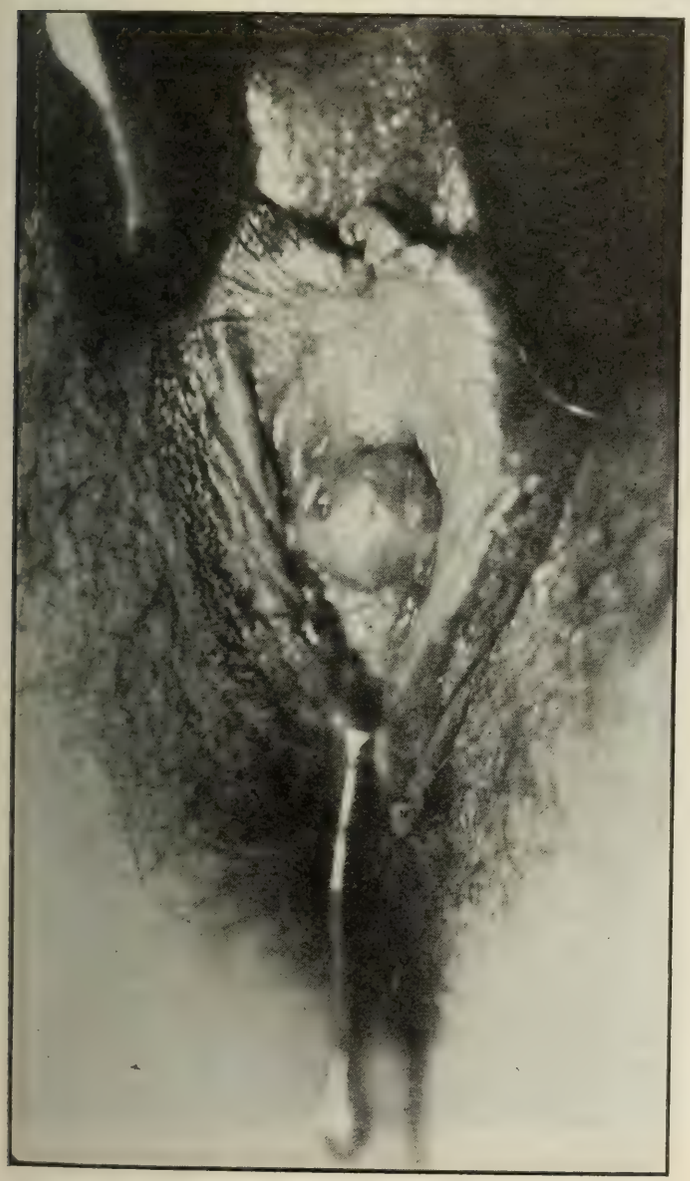

Fig. 3.—Case No. 2. Infection of two years' standing. Clinical diagnosis on admission, gonorrhea. Smears negative. Repeated cultures showed staphylococci and colon bacilli. No gonococci.

part of the prostatic urethra, we have a more accessible field in which to work both for diagnosis and treatment. In the male, infection of Littre's glands means a prolonged course because we have actively secreting glands to deal with; while its homologues in the female, the minor vestibular glands, are seldom infected.

Gonorrhea of the female urethra, like the illegitimate child, is very frequently disclaimed by both urologist and gynecologist. By inheritance and classification the infected female should be the property of the gynecologist. We do not believe that physicians are so careful in eradicating the gonococci from the peri-urethral glands in the female as they are in the

Fig. 4.—Case 2, showing enormous thickening of peri-urethral tissues. Para-urethral ducts gaping.

male. A definite criterion of cure can be maintained only by repeated clinical and laboratory studies.

The clinical picture of acute gonorrhea either in the male or female is too well understood to be dwelt upon at this time. The diagnosis of subacute and chronic gonorrhea is most difficult and should only be made or denied by a close cooperation between clinic and laboratory. In the female the diagnosis is especially difficult to establish or deny. In this connection the collection of material is very important. Cultures should be made of material from the

urethra and peri-urethral ducts or from Bartholin's glands, just as we examine the massaged contents of the prostate and seminal vesicles. The examination should be made with a definite routine labeling slides and cultures from each suspected area. This requires a vast amount of routine work, but, with a skilled bacteriologist to cooperate, it is well worth while.

The presence or absence of the gonococcus in the male and female urethra is of

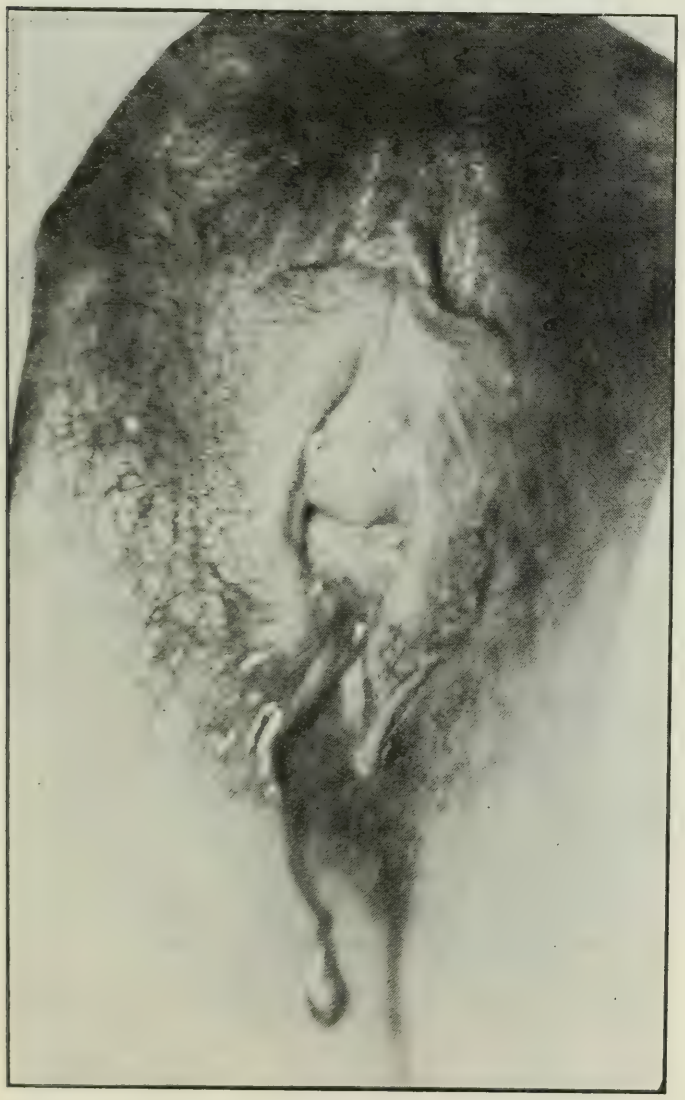

Fig. 5.—Same as Fig. 4 after massage. Note great drops of pus from para-urethral ducts.

supreme importance. Dr. Edward L. Keyes, Jr.,[2] says:

"Let us delay a moment to compliment the gentlemen who are able to diagnose the presence of gonococci in the urethra by the finding of a few intracellular gram-negative cocci. Scattered organisms, whether intracellular or not, whether gram-negative or not, do not mean anything. Even when the cells are packed with gram-negative organisms, the certainty is not complete. These gram-negative organisms packing the cells may be staphylococci. Should the clinic and laboratory disagree, the laboratory may be defied to cultivate the gonococcus. Positive gonococcus culture is positive proof of the presence of the gonococcus and takes precedence over all other evidence."

It is a prevalent opinion in many localities that the gonococcus is grown with such difficulty that its routine identification by this means is entirely impracticable in clinical work, yet methods for its growth are too numerous to mention.

We have made various attempts at finding a method for the cultivation of the

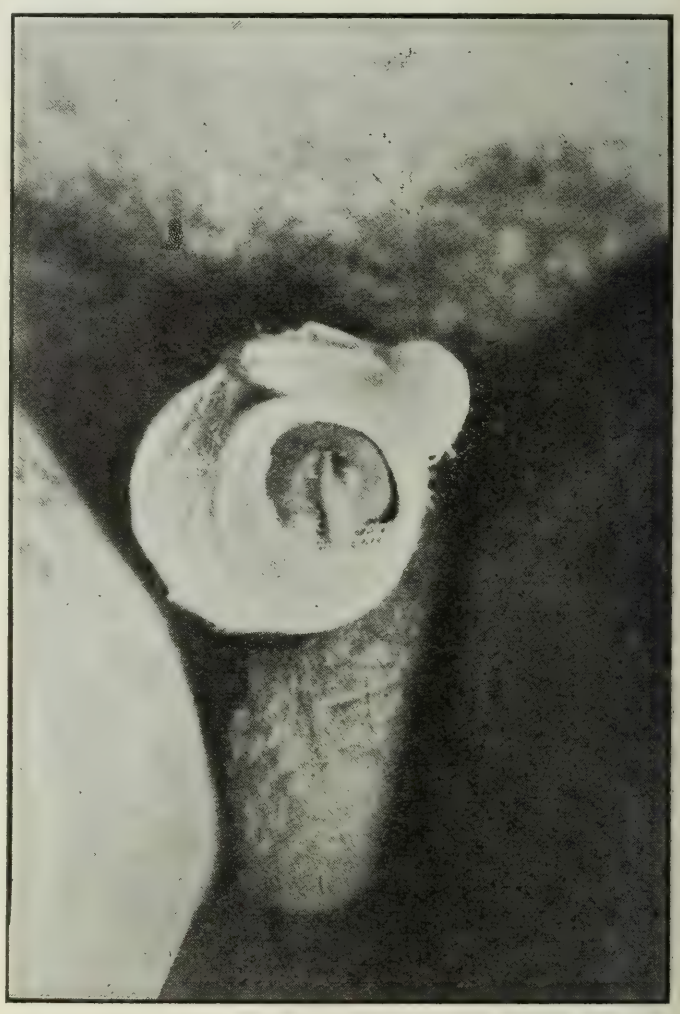

Fig. 6.—Case No. 3. Negative history. Repeated negative smears (our laboratory). Clinical diagnosis, gonorrhea. Culture positive for gonococci.

gonococcus which would be at once accurate, practical and simple. We feel after two years of its routine use in clinical diagnosis that we can heartily recommend Swartz'[3] method. Briefly, this is to prepare slants of the culture medium consisting of ascitic, hydrocele or serum agar of a suitable reaction containing an abundance of moisture. After inoculation of the surface of the slant the oxygen ten-

sion is lowered 10 per cent or more by heating the upper part of the tube culture and inserting an air-tight rubber stopper. We have found that pyrex tubes will stand the heating with less danger of breaking. Examination of the cultures can be made satisfactorily 24 to 36 hours later. Most strains grow abundantly and all preserve their colony characteristics and staining reactions. The lowering of the oxygen tension, furthermore, has an inhibitory action upon the growth of the usual saphrophytic organisms found and the gonococcus has for the first 24 hours, at least, an advantageous start in its growth. It is not at all unusual in acute gonorrheal infections to secure a pure abundant growth of the gonococcus in perhaps 90 per cent of the cases. In the others, and especially in the subacute and chronic cases, it may be necessary to pick the typical colonies from the primary culture and identify the organism by morphology, by staining reactions, and further cultural studies.

Fig. 7.—Illustrating the necessity for locating para-urethral ducts, both for obtaining material for diagnosis and determining treatment.

It is advantageous, as Swartz points out, to store the rubber-stoppered slants in the incubator, inoculate them promptly without chilling and lower the oxygen tension by heating the upper part of the tubes, replace the stoppers, and return the cultures immediately to the incubator.

In doubtful cases for diagnosis and in medico-legal cases the cultural evidence should never be dispensed with. As Keyes has stated, the positive culture takes precedence over all other evidence.

Fig. 8.—Emphasizing one successful method of treating Skene's ducts.

As a means to the determination of a cure, cultures of the urinary sediment in males and of the material from Skene's ducts and peri-urethral ducts in females will occasionally reveal living gonococci which might easily have been overlooked.

The method furthermore readily lends itself to the prompt preparation of autogenous vaccines, if these be desired, and to the securing of numerous strains furnishing abundant material for the preparation of antigens for use in complement fixation work.

Probably no two of us agree exactly on the best method of treatment for acute gonorrheal urethritis. Methods and drugs are legion and results are generally unsatisfactory. We are very much interested in calling your attention to what we shall call fundamental principles which must be applied to your method of choice. The suc-

cess of your favorite drug will depend upon how you apply it. Gentleness of application is more important than the selection of what you believe to be the all-important drug. Be kind to the already angry mucous membrane and do not traumatize it. We daily see cases of virulent gonorrheal infections in the male urethra with all the classical symptoms of a severe acute inflammation using irritating injections. This is only one example of misdirected treatment. In such a condition the physician is directing his patient to traumatize a very acutely tender meatus, to add insult to an already angry mucous membrane, thus defying a well known surgical principle. Too much is said nowadays about a favorite drug or method and entirely too little about when and how to use them.

In acute gonorrheal urethritis in the female, we should insist that the patient report regularly for treatment to a specialist who daily watches the progress of the disease and changes his treatment accordingly. We must not be satisfied with prescribing a vaginal douche and having the patient return when convenient.

In chronic gonorrhea of the female where Skene's glands are almost always infected, we have irrigated with a Luer syringe and blunt-pointed needle with most pleasing results. Where the duct is partially stenosed, we pass a fine probe and incise, or better, fulgurate. The latter procedure has given excellent results in our hands.

We intentionally omit any lengthy discussion of treatment for the various stages of gonorrheal infections, and we do not advocate any single drug or group of drugs because we feel that the method of treatment should be selected for each individual case.

Honesty and sincerity of purpose, gentleness of application, perseverance added to a thorough knowledge of the underlying pathology will usually indicate the proper method of procedure.

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DISCUSSION

Dr. Milton Weinberg, Sumter, S. C.—A thorough knowledge of the structural development of both the male and female urethrae and of the pathological processes of gonorrheal infection in these tissues is essential for the intelligent treatment of such infections. Whether the urologist or gynecologist should treat infections of the female urethra is a matter of little concern.

There is a distinct field of usefulness in the application of cultural methods for gonococcal infections, but they fall far short of fulfilling our need. It is still a difficult proposition in many cases to know whether or not a sub-acute or chronic gonorrhea is present.

Undoubtedly, cultural methods should take precedence over all others in making a positive diagnosis of the organism. It is only in this manner that we can be absolutely certain that the intracellular, gram-negative diplococcus is a gonococcus or not.

Certainly, cultural methods should be employed wherever there is a possibility of a medico-legal case. Though the making of cultures for the gonococcus is an aid, except in occasional instances, I do not believe that in the ordinary routine clinical work in gonorrheal infection it has yet added very much to the determination of whether such infection is present over the usual procedure of examination of the smears made fresh from the lesions.

Dr. Montague L. Boyd, Atlanta, Ga.—I had a case with infection of the micrococcus catarrhalis. This is so rare that it is hardly worthy of mention, but it looked exactly like a gonococcus and the differentiation was made only by extremely careful cultural work.

Dr. W. J. Wallace, Oklahoma City, Okla.—In every case we should urethroscope the urethra and learn definitely its pathology. Diet, usually overlooked, is an essential feature in treatment. I instruct all of my patients both as to what to eat and what not to eat, and require them to drink a great deal of water. This will apply to both the acute and the chronic cases.

I want to mention something which is not popular with the majority of urologists, from the use of which I am getting beneficial results. This is the administration of vaccine. I give it only in chronic cases and in complications following the acute condition. In the acute cases I have never found vaccine to be of any advantage. The method of giving it is as follows: usually begin with ten minims, subcutaneously, the first day, eleven minims the next day, and increase this daily until it reaches fifteen minims. If there is no marked reaction, I hold it at this amount, giving it each day until from fifteen to twenty doses have been administered. If the reaction is very great I reduce the amount, but do not discontinue the vaccines. It is my intention to keep the pa-

tient on the positive phase or just on the crest or edge of fever, until the last dose. Then I give from sixteen to twenty minims, hoping, thereby, to produce a marked reaction. The vaccine, given in this manner along with the general or combined treatment, will unquestionably benefit the majority of these cases.

Dr. H. W. E. Walther, New Orleans, La.—I have had some success with the high frequency spark in treating the female urethra. I use the high frequency electrode through the skenenoscope, an instrument that Dr. Stevens, of San Francisco, presented to us in New Orleans.

In regard to vaccines, I have to cross swords with Dr. Wallace, and many other men would do likewise. I have tried them in many ways, ascending and descending doses, autogenous and stock, and I have never yet seen any good results whatever follow their use.

Dr. Henry S. Morris, Nashville, Tenn.—I have been treating gonorrhea of the male and female for thirty-five years, and if I understood the Doctor to say that a Neisserian infection occurring in the male and female is a minor affair, life is a joke! When we refer to the alarming consequences that follow inadequate treatment of the female as revealed by the number of cases that go to the operating table for removal of the sexual organs and the loss of the function of reproduction, are we not struck with the necessity of giving these cases our utmost consideration? These cases, when improperly treated, rapidly assume the chronic state and then we are confronted with a problem which requires the most thorough skill to check the advancing destructive process.

It is difficult to estimate with any degree of accuracy the number of cases of gonorrhea, especially of the female, existing at present, as a very large number of such patients do not apply for treatment. I believe more are seeking relief, however, since the war, and the intensive work of our Government in behalf of venereally infected persons. Information from this source as well as magazine propaganda and the enlightenment of the present times is doing much toward a better state of affairs as relates to the female in all classes of society. We should work, work, work, and treat, treat, treat until we have relieved these patients. As far as treatment is concerned, that is, the manner and method of its application, there is much variance of opinion, but you should attend to it with all your skill.

Dr. T. S. Field, Jacksonville, Fla.—I wish to say a word in defense of the gynecologist. I just heard your essayist say that the gynecologist treats these patients in a haphazard manner and, being a gynecologist, I naturally took offense at that. I have treated many of these cases and do not believe that they can be successfully cured without extirpating the glands of the cervix. I have seen many cases which were apparently cured, with the discharge stopped, which infected some one else in later months. I cannot cure gonorrhea without extirpating the cervical glands.

Dr. Paul Gelpi, New Orleans, La.—One point is very important and that is the culture of the gonococcus. We have been told that many samples of stock vaccines had been examined and found free of gonococci. From the standpoint of diagnosis the cultural method described is exceedingly useful. As I understand it, the details are all important and must be carried out in just the right way. From the medico-legal standpoint also this paper is of great import.

Dr. Harry Young Righton, Savannah, Ga.—It is as essential to massage the urethral glands in the female in making a diagnosis as the prostate gland in the male. We have recently seen several cases where the urethra was involved but no infection had reached the cervix of the uterus. These cases can be treated most successfully by one of the latest agents, and that is mercurochrome. After you make the diagnosis, the patient is requested to urinate before you begin treatment to obviate the possibility of carrying infection to the internal sphincter. You then distend the urethra with mercurochrome, employing a glass bulb syringe. This can be done without pain and solution should be held there for several minutes.

In the treatment of cervicitis and endometritis, I have obtained results with the following treatment: I put the patient in an exaggerated lithotomy position, lift her buttocks about 45 degrees and fill the vagina with a 5 per cent solution of mercurochrome. I keep the patient in this position for about five minutes and use mercurochrome tampons. The next day much of the discharge from the cervix is colored red. Mercurochrome has a penetrating effect in the cervical gland. I also swab out the cervix, as it is usually plugged, and then put in a piece of cotton soaked in mercurochrome. I have many cases that I have followed for a long time, which cleared up not only culturally but by the clinical symptoms as well.

Dr. McKay (closing).—For fear some one may miss one of the important points of the paper, I will say that we have a cultural method which Swartz has perfected which is an easy procedure and by which we can verify our diagnosis in the sub-acute and chronic cases. In the acute cases clinical examination plus examination of smears is about all we need, but in the subacute and chronic cases we need some practical method to verify our diagnosis. If you will try growing the gonococcus as described by Swartz, you will find it a simple method which can be employed routinely.

If we are to progress in handling these cases we must be more careful about our diagnoses.

THE SO-CALLED RAILWAY SPINE*

By F. Walter Carruthers, M.D.,
Little Rock, Ark.

There is no doubt that there is not a man present at this meeting who has not handled or seen many railway cases that has not been confronted with what he calls a "railroad spine." But turning to the serious side of this so-called condition lies a very important problem that confronts the railway and industrial surgeon. As orthopedic surgeon for the Rock Island Railroad and several industrial plants, I have seen and been confronted with a great number of spinal cases.

Before taking up the question of treatment, let us study the spinal column from an anatomical point of view.

The spine is made up of several sections, the cervical, dorsal, lumbar, sacral and the coccyx. Its primary accessories are the ribs, ilium, ischium and pubis. The cervical and dorsal regions with their accessories the ribs, give us very little concern, but the lumbar, sacral and coccyx regions, with their accessories are a very different problem.

The anatomists tell us that in the sacrum and coccygeal portion of the spine with its accessories the pelvic bones constitute a very complex combination. From an early period of life, it consists of nine separate pieces, which unite in the adult to form two bones, five entering into the formation of the sacrum, four into that of the coccyx. The sacrum, formed by the union of five vertebrae, has thirty-five centers of ossification. It is furthermore classed as the false vertebrae. From the examination of a large number of skeletons it would appear that in one set, the anterior surface was nearly straight, while in others the middle portion showed a marked curve. In others it was hard to show much difference between the first two varieties.

All the above points are mentioned merely to remind you of the many varieties and complications that one encounters when one has to deal with a spine case. I shall show on the screen a number of dissected specimens. I shall try vividly to recall to your mind the anatomy in this region, and shall show you how it looks, step by step, to impress upon your eye and mind the real importance of this region.

Let us turn our attention to what is presented from the x-ray standpoint of these backs.

It is with considerable hesitancy that I approach the subject of x-ray findings, not because of any lack of faith in them, but on account of the inability to show the gross pathology to those who are always doubtful.

The x-ray of the lumbro-sacral and sacro-iliac region of the spine offers a very interesting field of study. We should if possible, have some knowledge of the relationship between the back symptoms and the x-ray findings in these cases.

Those of you who have studied the x-ray findings in these regions will agree with me that it shows an almost unlimited variety, and at times it is almost impossible to state just what is normal as compared with abnormal.

Dr. Archer O'Reilly, of St. Louis, made a very careful study of a number of dissected cadavers in this region, and came to the conclusion in his series that there were no marked abnormalities. However, on comparison of the x-rays before dissection, and his findings afterward, he saw that the dissected specimens showed some osteo-arthritic changes that the x-ray did not show.

I wish to show you on the screen a number of different varieties of lumbar, sacro and iliac spines, and in doing so to call your attention to the striking similarity between backs that give no symptoms and those that do. I wish to emphasize the question of liability in those so-called injuries in comparison with negative findings in the case. The point that should be taken by the large industries is a careful examination and x-ray of those cases that give the slightest history of any previous back trouble, in order to have a check on the case in any future trouble.

The patient's pictures that I wish to show range in age from 20 to 60 years.

*Read before the Southern States Association of Railway Surgeons, Auxiliary of the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

In each case I have tried to secure the same type of back to compare with the one that is giving the trouble, in order to show the striking similarity and irregularities at the lumbo-sacral articulations in persons suffering with backache, as compared with those who have never had a back symptom. One should be very, very careful in case of injury, in stating that there has been a displacement or fracture as result of an accident.

In the varieties I wish to show, a most common type is that in which the sacrum is set low between the ilia, with a comparatively narrow sacro-iliac joint. This gives the suggestion of weakness at this point and the likelihood of a sacro-iliac strain. The long lumbar space in itself is very suggestive of the same thing. This is the type that gives a great deal of trouble.

The other varieties are the common fan-shaped transverse process, the bifurcation of the first sacral vertebra, and the overlapping transverse process of the fifth lumbar.

Another important thing in this connection is the question of fracture of the spine. I shall show you on the screen pictures of the following case:

A female, age 21, was brought to the hospital in a state of semi-consciousness. Her friends stated that about one hour before while in a downtown department store shopping she opened an elevator door, stepped in and fell through the shaft, landing on a concrete floor, fifteen feet below. She was picked up and carried out profoundly unconscious. Thirty minutes later she developed convulsions which lasted thirty minutes. After arrival at the hospital she would at times be aroused and complain that her back hurt.

Examination showed a young woman well developed and nourished with marked pallor and evidence of profound shock. However, she could be partially aroused. The pupils were regular and reacted to light and accommodation. Both shins and knees were bruised. At the region of the twelfth dorsal vertebra there was a slight kyphosis, and on pressure over this region she complained of pain. There was no other complaint.

The x-ray of the spine was made in both the anterior-posterior and lateral positions. It is very important in these cases that the x-ray be made in both directions, for it is very easy to overlook a fracture in attempting to diagnose your case from the anterior-posterior view alone, as may be seen by the picture.

Fractures of the spine are practically all reduced by flexion and extension, the procedure carried out in this case. In due time, after a properly fitted Taylor spine brace was applied, she was permitted to be up.

Fractures of the spine are rather common things and should not be considered serious if there are no neurological findings. If these are present, the injury should be judged according to the symptoms.

DISCUSSION

Dr. W. W. Harper, Selma, Ala.—We have been disposed rather to ridicule these backs, because we have not been able to find any gross pathological lesions. I have more sympathy with these cases than I used to have, for I have been suffering with a lame shoulder for two months. The symptoms came on suddenly without any apparent cause. After having been examined by several good doctors, an orthopedist diagnosed a neuritis of the circumflex which resulted in a partial paresis of the deltoid. This allowed the arm to drop and make traction on the capsule of the shoulder joint. The neuritis was from a focal infection and pain and disability were cleared when a dead tooth was removed.

In the type of cases reported by Dr. Carruthers there is an abnormal mobility in the sacro-iliac joint and a cure will be effected only when an arthrodesis is done.

Dr. Theodore Toepel, Atlanta, Ga.—In any kind of concussion of the spine, whatever it may be, rest is of primary importance. If rest does not relieve the condition, further investigations must be made and perhaps operative procedures be resorted to. I want to relate one case, which may be of interest to you. One of my patients suffered with a sacro-iliac strain similar to those mentioned by the previous speaker, from an accident which occurred when she was six months pregnant. She went the full term and gave birth to a healthy child. The accident occurred when she started to step off a street car and before she landed safely on the ground the car started while her hand was still on the hand rail of the car. This gave her a sudden jerk and she fell and severely injured herself. I was called in about three months after she had given birth to the child. She could not get up with comfort and when she did, suffered with excruciating pains in the region of the lower back. She had been told to get up and exercise. After a thorough examination I advised an x-ray, which confirmed my diagnosis of a separation of the bones of the sacro-iliac joint. Owing to the condition of the patient at the time of the accident a relaxation of the ligaments of the joint had taken place. I treated this case by absolute rest in bed and strapping by adhesive bands for six weeks. I then allowed her to get up, wearing a snugly fitting sacro-iliac belt. She is now able to move about and pursue her usual household duties.

EYE, EAR, NOSE AND THROAT

SOME OBSERVATIONS ON EYE LESIONS OF NASAL ORIGIN*

By Joseph D. Heitger, A.B., M.D.,
Louisville, Ky.

When we consider the intimate relationship existing between the contents of the orbit, i. e., the eyeball as a whole with its extrinsic muscles and optic nerve, blood and lymph vessels, and the nose with its accessory sinuses, which are exposed to repeated attacks of an inflammatory character, it becomes a source of wonder that eye lesions of nasal origin are not more frequent. Their frequency, proportionately small though it is, presents an interesting field for study and has developed a voluminous literature composed of the researches and reports of Hajek, Sluder, Onodi, Uffenorde, Woakes, Van der Hoeve, Wright, Loeb, Dean, Gradle, Posey, Bordley, Brawley, Thomson, Stark, Ellet, Vail, deSchweinitz, Holloway, Peter, Reber, Shumway, White, Haitz, Bissell, Lloyd, Cary, Luedde, Ewing, Mosher, Gallaher, Goldschmidt - Osmund, Warlow, Cutler, Benedict, Lillie, Skillern, Beck, Harmon Smith, Cushing, Haskin, Hurley, and others.

From a review of this vast literature, and from personal observation, I have been impressed with certain fundamental outstanding points, which will be elaborated in the course of the paper and give us common ground for discussion.

One should constantly keep in mind the difference between the suppurative and non-suppurative character of nasal pathology productive of eye lesions. Neglect of this has resulted in much unfortunate confusion in the past, as evidenced by the following statement in an article published last year by Bordley in the *Archives of Ophthalmology:*

"To depend solely upon intranasal inspection is folly—more frequently one would be misled than helped. There are but three reliable indications of sinus disease to be elicited by such an investigation: pus, polypi, and necrotic bone; and they are more frequently visually absent than present."

The author of this statement is correct in so far as he goes, but he has in mind only the suppurative type of nasal pathology. He ignores entirely the non-suppurative which is productive of eye lesions which are as serious as those produced by the suppurative type of nasal disease.

On these two types of nasal disease we have two classics, namely, Hajek's work on the suppurative diseases of the nasal sinuses, and Sluder's on the non-suppurative diseases. These texts form the keystone in the arch of our knowledge of the subjects outlined. Since their publication the authors have not found it necessary to retract a single basic statement advanced by them.

Progress and advancement in our knowledge of the relation of nasal to eye diseases have been brought about largely through a close cooperation between the internist, neurologist, radiographer, the ophthalmologist and rhinologist, and I would here make a plea for even a closer cooperation in the future than has existed in the past. Such a harmonious association would result in a dissemination of special knowledge to all the participants, and redound to the ultimate advantage of all concerned, including the patient.

The type of eye lesion of nasal origin which has been most commonly reported and discussed is that of the optic nerve, including choked disc, papillitis, atrophy and retrobulbar neuritis. Eye diseases less frequently observed are those involving the choroid, retina, iris, ciliary body, cornea, sclera and extrinsic muscles of the eye. These latter have been perhaps associated more frequently with the non-suppurative type of nasal pathology, and their importance is becoming more apparent as our ability in the diagnosis of the non-suppurative type of nasal disease increases.

Lues, arteriosclerosis, nephritis, diabetes, tuberculosis and focal infection have been in the past the main etiological factors in the production of the eye lesions enumerated. To this list must be added

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

both the suppurative and non-suppurative nasal disease. Such nasal disease may be coexistent with the other etiological factors so that in the future multiple causes must be considered as taking the place of the single etiological factor formerly accepted.

We cannot longer afford to be satisfied when a possible single cause for an eye lesion has been found, and this becomes of especial importance when treatment based on such a single cause fails to produce adequate and prompt results. There exists a "wheels within wheels" phase of these etiological factors in that the patient can have a sinus disease caused by lues, tuberculosis, toxins or focal infection, so that these diseases are not the direct cause of the eye lesion but the indirect, whereas the sinus infection is the direct cause.

Confirmative reports are in abundance to warrant one in formulating the rule that in all eye lesions one should be ever mindful of the nasal sinuses, and this becomes of the greatest importance in those eye diseases of obscure origin. Repeated examinations are often necessary before a diagnosis of sinus disease can be established or eliminated.

Those who were fortunate enough to hear Dr. van der Hoeve, of Leiden, Holland, last year at the meeting of the American Academy of Ophthalmology and Otolaryngology could not fail to have been greatly impressed by two statements which he made bearing on the subject of this paper.

"The ophthalmologist has in the eye no sign at all to distinguish the origin of a retrobulbar neuritis; the rhinologist cannot say with absolute certainty that a person has no sinus affection."

These two statements cover a vast territory and are axiomatic.

One must not forget the relationship existing between the pituitary and sphenoid, and one must not be too quick to interpret good results from changes in visual fields following operative manipulation in the sphenoid area as indicative of sphenoid disease alone, as pointed out by Benedict and Lillie. Bleeding and changes in lymph current may result in temporary improvement in the visual fields of pituitary cases, both intra- and extra-sella.

Much divergence of opinion exists at the present time regarding the pathologic mechanism which is active in the production of eye lesions of nasal origin. A majority of the cases reported in the literature are discussed more along clinical than histopathological lines. Lack of pathological confirmation is more than overbalanced by an abundance of clinical material and results.

So far as I have been able to determine, the most comprehensive histopathological reports existent are those of Jonathan Wright obtained first from a study of Sluder's specimens, and later those of White. Wright states that it is sometimes difficult to draw a distinction between the phenomena of physiological and pathological changes in nasal tissues, and this is made more difficult for the general pathologist because of the ravage produced in the process of ridding the tissues under examination of the bone salts to allow sectioning. Absorption of the bone salts is a part of the pathological process in hyperplasia of the sinus walls, and this adds difficulty in the interpretation of the line between pathological and technical alterations in the tissues.

Wright's description of the pathological change occurring in the bone and mucous membrane is given in his text book and in the introduction to Sluder's text, "Headaches and Eye Disorders of Nasal Origin," and at the risk of repetition I wish to recall a few of the most important features mentioned. He speaks of the chronic inflammatory changes to which the nasal structures are subject, as due to the substitution of the stimulus of irritation, whether from external surface agents, from bacterial agents of disease within the surface, or from systemic vasomotor disorders, for that mysterious physiological stimulus of growth which carries with it some agency which shapes the symmetry of form. In this substitution, the agent which shapes the symmetry of form is absent or works badly to produce asymmetrical development in the hyperplastic, irregular and purposeless cavities in the rarefying bone changes, or osteitis.

Wright's conception of the nature of the metabolic processes of bone in healthy and diseased nasal structures is given in several drawings illustrating the building-up process of bone by osteoblasts and the ab-

sorption process by osteoclasts with a transition stage between. With the change in cell form of osteoblast to that of osteoclast there results a reversal of metabolism. The multinuclear osteoclast is usually formed by a fusion of several adjoining mononuclear osteoblasts, but the osteoclast may occasionally be formed by multiplication or proliferation of nuclei in a single cell. This bone process is inaugurated as a sequence of an ordinary hyperplasia of the mucous membrane of the turbinate bodies or lining membrane of the sinuses. These bony changes may be found in almost any nose, but whether or not they give rise to symptoms of an annoying or distressing character depends entirely upon their location; so that the specificity of pathological activity is not so important as the specificity of its locality. The skulls showing abnormal development of the nasal sinuses exhibited by Schaeffer at the American Medical Association meeting in Boston, in 1921, readily demonstrate how variable this specificity of locality may become.

Along the same line one conversant with Wittmaack's work on the pneumatization of the temporal bone cannot help making a conjecture on the possible parallel analogous relations existing between pneumatization of the temporal bone and nasal sinuses and their influence on pathological conditions. Delayed or arrested pneumatization in the nasal sinuses occurring in the first few years of life may exert a hitherto unsuspected influence upon pathological changes occurring in later life.

Besides hyperplasia, with or without periostitis, as an explanation of the pathological mechanism at work in these eye lesions, edema, pressure, toxins, inflammation and congestion are mentioned.

It has appeared to the writer that too many inconclusive terms have been used in the past of the nature of "Mother Hubbard" remarks which cover a vast deal but touch nothing. Physics and pathology have been confused. The use of the word pressure should be qualified. For example, to speak of pressure in the attic of the nose; pressure of middle and superior turbinates; or pressure between the septum and posterior ends of the turbinates, means so little that the term loses its effect on logically reasoning minds. Simple mechanical pressure such as is exerted by a sphenoidal mucocele, and pressure of inflammatory products under tension, involve widely different pathological mechanisms. If the word pressure is to be retained it would perhaps be best used as a designation for simple mechanical pressure.

In a paper before this Section last year Sluder reported three anatomical, clinical and pathological observations bearing upon the etiological association between the nose and eye lesions. The first was by Uffenorde dealing with the anatomical condition of vessels communicating between the membrane of the sphenoidal sinus and the optic sheath in the optic canal. The second was by Sluder himself in a case of serous iritis presumably secondary to a sphenoiditis where in the sphenoid he observed a lesion upon the optic canal showing blood vessels converging to meet at its center. The epithelium was greatly thickened at the center, of a dirty gray color and gradually faded into the normal at a distance of half a centimeter. The third was by de Klein and Gerlach, who at autopsy demonstrated an encapsulated diplococcus in the secretion and membrane of the sphenoid and the optic sheath in the optic canal and also in the optic nerve.

To these I desire to add a fourth observation, in Case I (Mrs. F. A.), reported at the close of this paper. During the removal of the anterior sphenoid wall and posterior ethmoid cells by the Sluder technic it was noticed that a large mass of hyperplastic tissue had eroded its way into the sphenoid cavity through the anterior wall of the sphenoid. This mass was dumb-bell shaped and came away with a large portion of the anterior wall of the sphenoid encircling the constricted portion of the hyperplastic mass. This gave a free view into the sphenoid. At the upper outer angle of the sphenoid along the course of the optic canal a hyperplastic mass irregular in shape and about one centimeter in diameter with thickened epithelium and irregular macroscopic vessels on its surface presented itself to view. Careful probing around its base and pedicle failed to elicit any necrotic bone. It was seized carefully with forceps, in one

of those moments that try the operator's soul, and was removed without any apparent injury to the district of the optic canal or cavernous sinus. Pathological examination of the tissue showed chronic inflammation.

The diagnosis of eye lesions of nasal origin involves many problems for the examiner. The importance of single and multiple etiological entities has already been mentioned. After routine medical, neurological, dental, serological and roentgen ray examinations have been completed without arriving at any definite conclusion, it frequently falls to the lot of the rhinologist to make and complete the diagnostic picture. He can seek aid from the fundus and perimetric examinations of the ophthalmologist when such are obtainable, and from the radiographer when roentgen ray interpretations can be properly evaluated. Such conditions do not, unfortunately, always obtain. Anterior and median rhinoscopy and the use of the nasopharyngoscope may offer assistance, but the sheet anchor of diagnosis, if such may be said to exist, lies in posterior rhinoscopy. This method, I fear, is too often neglected, or, when used, is perfunctorily done because of improper illumination and failure to recognize slight departures from the normal in the membrane and structures in the post-ethmosphenoidal district is the result.

Sluder has given us the best description of the normal post-ethmosphenoidal district and the variations in this region which may be interpreted as diagnostic factors in determining eye lesions to be of nasal origin. I would refer you to his text for the details. In general one must translate and interpret the color, thickness and translucency of the epithelium and membrane of the olfactory fissure and the character of its vascularity, smoothness and secretion. The size and character of the plica septi and posterior tip of the middle turbinate, which may be considered as forming the lower boundary of this district, should be emphasized. A consideration of the wiping action of the soft palate is of paramount importance. In small and medium-sized pharynges it often becomes necessary to recognize secretion anterior to the choanal plane, and here obliquely illuminated thickened epithelium on the edges of convexities and concavities must be differentiated from purulent secretion. This differentiation becomes of the greatest importance at the upper choanal arc. Proper differentiation can only be accomplished by proper illumination and repeated examination.

The best form of illumination is direct sunlight. This is not always available and must be employed with the concave mirror more or less out of focus, because if focussed, the light becomes too hot to be borne by the patient. Even when used with the head mirror out of focus there is apt to be too much glare and important details are obscured. The arc lamp offers a white, bright light free from disproportionate excess of reds, greens and yellows and is a satisfactory substitute for sunlight. Lights containing greens, reds and yellows interfere with a correct estimate of the color of the membrane and the thickness and opacity of its epithelium. The lights used by most rhinologists are unsuited for proper posterior rhinoscopy both from the standpoint of insufficient brilliance and whiteness. When compared to the arc lamp they are, to use the words of the Arkansas Senator, "As the puny light in the tail of a lightning bug to the glorious effulgence of the noonday sun."

The examination of the visual field often assists materially when it can be made. The most frequent loss of function appears in the peripapillary and central fibers producing, respectively, an enlargement of the blind spot, and central scotoma. Just why this occurs we do not know, but we are forced to accept it as a fact. Both types of scotoma are at first relative for colors, and later, perhaps, for form. There may be combinations of the two types when, by enlargement of one or the other, fusion occurs and produces the well known oval scotoma including and surrounding the fixation point as well as the blind spot. The enlargement of the blind spot is the more frequently observed, but an enlargement of a central scotoma can extend until it fuses with the blind spot to form the oval scotoma. When such an oval scotoma is present its method of development cannot be determined. As the symptom subsides repeated examina-

tions of the central field may give us data upon which the method of its development may be conjectured. When such symptoms are found the nasal origin must be determined by exclusion of other causes, such as high myopia, medullated nerve fibers, hysteria, degeneration or hemorrhage into the macula, chemical intoxications, glaucoma, multiple sclerosis, tuberculosis, lues, focal infection, new growths, etc.

Roentgenograms of the nasal sinuses may at times assist us in the diagnosis of sinus disease, but their interpretation is beset with many difficulties. Stereoscopic plates of the sharpest possible definition, presenting direct comparison of symmetrical parts, with projection of the structures at the base of the skull, especially the petrous portions of the temporals and the cervical spine, producing confusing shadows, into areas where their shadows will dovetail with known structures, without serious overlapping of these shadows, offer us the best opportunity to determine the character of the disease in the sinuses, namely, whether it is suppurative, nonsuppurative, or new growth formation. We can further depend upon the roentgenogram to determine the presence or absence of a sinus and its shape and size, but not always the nature of its contents. The x-ray is often disappointing and unreliable in the diagnosis of mucocele and the nonsuppurative type of sinus disease.

Van der Hoeve calls attention to nine cases of mucocele of the sphenoid not shown by the radiograph but diagnosed by exploratory operation upon the sphenoid. The method adopted by the late van Zwaluwenburg, of the University Hospital at Ann Arbor, Mich., and elaborated by Canfield at the recent Academy meeting in Minneapolis, accomplishes more nearly perhaps than any other the ideal of the radiographer, namely, the diagnosis of the character of sinus disease. On the whole, roentgenograms have been in general more or less disappointing, and many observers have gained little from their application. To express it in the form of a Hibernicism, "They have often led to the diagnosis of sinus disease where no disease existed, resulting in operations made in good faith but with bad judgment." Where good results have been forthcoming they have developed from a sympathetic relationship between the rhinologist and radiographer, both able to so interpret the plates as to adjust their differences of opinion and explain their differences of observation. Many of the points already mentioned show how such conditions as lues, albuminuria, diabetes, arteriosclerosis, brain lesions, focal infection, tuberculosis, multiple sclerosis, etc., can confuse nasal examination. They should give the rhinologist opportunity to investigate thoroughly, and repeated examinations will often determine slight changes readily overlooked in conditions which at first sight are not obvious post-ethmoid or sphenoid cases. All of this emphasizes again the small changes which may be responsible for ocular lesions.

In considering prognosis we must distinguish between the reparable affections which may exist even for months and the irreparable ones leading to degeneration and atrophy. We need a better insight into the manner in which nasal disease involves the ocular structures, and this can only be obtained from autopsy material, which is rare, as these cases are seldom fatal; and histological and bacteriological examinations of specimens removed at operation. Prognosis depends in general upon early diagnosis followed by complete and comprehensive operation where treatment does not produce rapid results.

The following case histories illustrate a few of the various types of eye lesions which I have encountered:

Case I.—Mrs. F. R., an American housewife, aged sixty years, consulted me November 12, 1920, suffering from a uveitis of the left eye which began in February, 1920. Nothing relevant was elicited from her family or past history. Her trouble developed gradually without pain and with gradual loss of sight. She had been in various competent hands since April, 1920.

General physical examination in a diagnostic clinic revealed a possible cholecystitis which was not considered by the surgeons to be sufficient for operation. Roentgen ray examination of the chest, stomach and intestinal tract was negative. One urine examination showed a few pus cells, but two days later a catheterized specimen was negative for pus. The patient had phthalein 35 per cent. Her teeth were removed with the exception of one root, which was negative in the roentgenogram. The tonsils were atrophied. The nose was reported negative except for a vestibulitis, worse on the left side. The Wassermann, both blood and spinal fluid, was negative.

Examination of the left eye showed the posterior surface of the cornea completely covered with a diffuse, grayish deposit, giving the whole cornea and anterior chamber a cloudy appearance. The iris was muddy and the outline of the pupil could hardly be seen. No fundus details were obtainable. Light perception and projection were absent. Finger tension was equal in both eyes. Vision O. D. with correction, plus 0.50 S. ⌒ minus 1.00 C. axis 80 was 20/30. She was using dionin and atropin locally in the left eye and taking potassium iodid internally.

Examination of the nose revealed a left-sided hyperplastic post-ethmosphenoiditis.

During the meeting of this Association in Louisville, in November, 1920, the patient was seen by Drs. J. C. Beck, of Chicago, and M. F. Arbuckle, of St. Louis, who concurred in the diagnosis. Puncture and washing of both antra relieved the vestibulitis. The patient refused operation and left.

She returned January 24, 1921, and was operated upon January 27, 1921. The Sluder upper cell operation was done under cocain block anesthesia. High cribiform middle turbinectomy was first done. The posterior insertion of the middle turbinate was well bowed into the nose, producing a sort of downward continuation of the sphenoethmoidal recess. In this recess there was a large mass of hyperplastic polypoid tissue which had eroded an opening into the anterior wall of the sphenoid, into which it protruded as a dumb-bell shaped mass. The mass came away with a large portion of the anterior wall of the sphenoid encircling it at its constricted middle. This gave a free view into the sphenoid. At the upper outer angle of the sphenoid along the course of the optic canal a hyperplastic mass irregularly about one centimeter in diameter with thickened epithelium and irregular macroscopic vessels on its surface presented to view. This was removed carefully with forceps. Post-operative pain was controlled with aspirin, as the patient could not take opium derivatives.

February 4, 1921.—The spots on the posterior surface of the cornea and anterior surface of the lens were fewer in number and discrete. Atropin and dionin were continued. Light perception and projection were present.

March 17, 1921.—Only a few discrete deposits remained on the posterior surface of the cornea and anterior capsule of the lens. The vitreos was full of large and small floating opacities and details of the fundus could occasionally be seen.

May 19, 1921.—The patient reads 20/100 to 20/70 with her left eye. All deposits in the anterior chamber were gone. The vitreos opacities were rapidly disappearing. The operated area had healed satisfactorily and was well ventilated and drained. Fundus details were visible.

August 31, 1921.—Vision with the left eye with correction 20/30. A few floaters were still in the vitreos.

This case was especially interesting because of the long interval existing between its inception and diagnosis and operation of the etiological factor with return of almost normal vision after loss of light perception and projection for several months.

The following case is reported to show the effect of a low grade hyperplastic sphenoethmoiditis on the accommodation.

Case II.—Mr. W. S. F., an American publisher, aged sixty, consulted me, stating that glasses which he had obtained three weeks previously from a local oculist were unsatisfactory, especially the right lens. He was wearing Kryptoks, O. D. plus 2.00 S. ⌒ plus 0.25 C. x 90. O. S. plus 1.75. Reading add plus 3.00. O. U. vision without correction, O. D. 20/200, O. S. 20/50. With my examination he accepted: O. D. plus 3.00 S. ⌒ plus 2.50 C. x 130. O. S. plus 2.00 S. ⌒ plus 0.50 C. x 10. Reading add plus 2.00 O. U. V. O. U. with correction 20/20. Examination of the fundus was negative.

The next day he returned after obtaining his glasses, stating that his distant vision with his glasses was blurred. Re-examination developed best vision with right eye from the following: plus 2.00 S. ⌒ plus 2.00 C. x 130. A few days later this lens for the right eye was unsatisfactory. Visual fields were negative and tension was normal. General neurological serological, roentgen ray and dental examinations were reported negative. Treatment directed toward a right-sided, low grade, post-ethmosphenoiditis quieted the irritable ciliary muscle and the right eye went into proper function.

The following case is reported to show how cocainization of the nasal ganglion relieved the pain of a herpes ophthalmicus which did not yield to opium derivatives:

Case III.—Mrs. M. G., an American housewife, aged thirty-four, consulted me August 7, 1921, suffering great pain from an extensive herpes ophthalmicus involving the right side of the head, forehead, eyelids and cornea. Hypodermic administration of morphin and codein by mouth had failed to relieve her intense pain. Cocainization of the right nasal ganglion promptly relieved the pain and relief continued for about twenty-two hours, when it recurred and was promptly relieved by the same treatment. This was done for eight successive days, when the pain ceased as the eruption began to dry.

This case illustrates the result of incomplete operative measures in delaying recovery, and emphasizes the necessity of high cribiform middle turbinectomy to assist in favoring drainage and clearing the operative field in order to properly approach anomalous ethmoid cells as emphasized by Sluder.

Case IV.—Mrs. B. B. M., an American widow aged sixty-six years, was seen by me October 24, 1921, complaining chiefly of blurred vision of the right eye of some five weeks' duration. Medical, neurological, dental, serological and x-ray examinations in a search for the etiological factor were

negative, and an exploratory operation had been done on the right posterior ethmoids and sphenoid before she consulted me. Her family history was negative. Past history elicited nothing relevant except that she was susceptible to headaches and acute attacks of rhinitis, and presbyopia had set in at forty years of age. Vision O. D. 20/200, O. S. 20/30 with correction: O. D. plus 0.75 S, O. S. plus 0.50 S. ⌒ plus 0.75 C, axis 175. Reading add plus 2.50 O. U.

Examinations of the right eye were negative except the ophthalmoscopic and perimetric. Perimetric examination developed concentric contraction of fields for colors and forms and enlargement of the blind spot for colors and form. The media were clear. The disc head showed a hemorrhagic neuroretinitis with several cotton-white patches irregularly distributed on the nasal side of the disc. The hemorrhages were small and flame-shaped with general edema of the retina. The vessels were tortuous and well filled, with here and there disappearance in the edematous retina.

Examination of the nose disclosed the right posterior ethmoids partially and the right sphenoid opened. All this area was covered with an abundant purulent discharge. The upper overhang of the right middle turbinate and the superior turbinate were still in position and covered with the same purulent discharge. The right antrum had been punctured and washed and pronounced negative.

Both antra transilluminated well. Under treatment there was little change in the eye condition, although the purulent discharge and edematous tissue in the operated area were greatly diminished.

On December 9, 1921, the Sluder operation under block anesthesia was done on the right ethmoids and sphenoid. The anterior and middle ethmoids were ventilated and drained, after removal of the upper overhang of the middle turbinate, which was left by the previous operator. There were many synechiae between this stump and the septum and between it and the ethmoid capsule. After this was removed a bulging of the ethmoid capsule high up and posteriorly was noticed. The sphenoid knife was carefully introduced, and an ethmosphenoid cell slightly larger than a pea was opened, which was filled with thickened hyperplastic tissue and a thin colorless secretion. The patient had experienced no pain whatever until the time of opening this cell. After this anomalous cell was opened she complained of considerable pain on the right side of the head. As the sphenoid had been opened by the previous operator, and it appeared to be draining well and ventilated, it was not disturbed.

Improvement was rapid, so that within a month the hemorrhages in the right retina were practically absorbed. The nasal discharge soon ceased, and the patient was discharged March 25, 1922, with the retina clear and vision of the right eye 20/50.

This case proved beyond the question of a doubt the superiority of the Sluder operation, as any other technic would have failed to reach the anomalous post-ethmoid cell.

This case illustrates how lues diagnosed serologically may confuse diagnosis of the etiological factor in retrobulbar neuritis of rapid onset.

Case V.—Mrs. D. S., American widow aged twenty-three, was first seen by me November 20, 1919, complaining of blindness of the left eye, associated with severe pain in the left side of the head of several days' duration. Family history was negative. Nothing of importance was obtained from her past history, except that for the past six years she had at intervals suffered attacks of severe pain in the back of the head and neck, and in April and June, 1919, she had contracted influenza. Since the last attack in June, 1919, she had not been well.

Medical, neurological, dental and x-ray examinations were negative. Wassermann was reported two plus.

Vision O. D. 20/200. With correction —2.00 C, axis 140 V. 20/70. O. S. Doubtful light perception.

Examination of external eye, media and fundi negative except for slight blurring of edges of left disc and slight dilatation of left pupil, which did not respond to direct light, but reacted slightly to consensual light and accommodation.

Examination of the nose showed a hyperplastic post-ethmosphenoiditis, bilateral.

Adequate antispecific treatment produced no results, so on November 27, 1919, the postethmoids and sphenoid on the left side were operated by the Sluder method, with a rapid and prompt recovery.

A pathological diagnosis of chronic inflammation was reported from an examination of the tissue removed.

On December 4, 1919, the patient could see well. Discharged January 8, 1920, with vision of the left eye 20/40 with correction plus 2.00, axis 120.

This is another case of possible multiple etiology which cleared up under nasal treatment alone, after running a course of four months with only local eye treatment and entire neglect of the nasal factor.

Case VI.—Mr. R. V. K., Canadian turfman, aged thirty-three years, was brought to me April 8, 1922, in a highly nervous state after an attempt at suicide as a result of being told by a colleague that everything possible had been done for his eye and that he would be blind.

His family and past history were negative.

Early in January, 1922, lachrymation of both eyes began. About a week later vision in the left eye became blurred and the "centers of things appeared punched out and black." His eye did not become red, and he suffered only occasional twinges of pain about and in the eye. Wassermann and urine examinations had been reported negative by his oculist. He had been given medicines, one of which "enlarged his pupil," and the other would make his eye "very red"—probably atropin and dionin.

The anterior segment of the left eye was negative except for an irregular left pupil and several posterior synechiae.

The pupils reacted to light and accommodation. Ophthalmoscopic examination was negative. Vision O. D. 20/20, O. S. 20/70.

Perimetric examination showed concentric contraction of the left field for form and colors with enlargement of the blind spot for form and colors, and an absolute central scotoma about two degrees in diameter.

Medical, neurological, serological and x-ray examinations were negative.

Dental examination showed the left upper second lateral incisor impacted and unerupted with large apical rarefaction of the second lower left molar.

Examination of the nose showed by posterior rhinoscopy a thin stream of white pus coming down the anterior face of the left sphenoid.

The patient began to improve under treatment directed to the purulent sphenoiditis, and did not have his infected and impacted teeth extracted.

He was dicharged June 5, 1922, with vision of left eye 20/20—. and again urged on general principles to have his diseased teeth extracted.

The presence of the posterior synechiae brings up the question of possible single or multiple etiology.

The rapid recovery of vision after treatment directed to the purulent sinusitis was instituted gives the case the appearance of being of strictly nasal origin.

CONCLUSIONS

(1) In all eye lesions one must be mindful of the nasal sinuses as a possible etiology.

(2) Repeated careful examinations with proper illumination are often necessary to disclose small, easily overlooked changes in the post-ethmosphenoidal region which may be productive of ocular lesions.

(3) Sluder's careful clinical descriptions, coupled with Wright's histopathological diagnoses, based upon Sluder's specimens removed at operation, offer the most practical approach to the study of eye lesions of nasal origin.

(4) Early differential diagnosis and complete comprehensive operation when treatment fails to produce rapid results are of great importance in the prognosis of ocular lesions of nasal origin.

(5) More qualified use of the word "pressure" is needed in the literature dealing with eye lesions of nasal origin.

(6) Closer intensive group study is necessary if progress is to continue.

Francis Building.

DISCUSSION

Dr. W. T. Patton, New Orleans, La.—There is a tendency among some eye men, when they find tuberculosis, albuminuria, sugar, etc., to treat the case simply for the albuminuria, sugar, or tuberculosis. The main trouble often is in the infection in the sinuses.

In old age, lesions of the eye may be caused by degenerative changes of the macular region due to arteriosclerosis, but quite often they are due to toxemia or to disease of the posterior sinuses. Opening the sinuses will improve the condition. Sugar may be secondary to a sinus condition. It has also been proven that irritation of the posterior lobe of the pituitary can cause sugar in the urine, and that disease of the sphenoid, irritating the posterior lobe of the pituitary, will also cause the same condition. Several cases have been reported where opening the sphenoid has cured both the sugar and the eye conditions.

If the ophthalmologist finds eye symptoms which the ophthalmoscope cannot account for, and in which the muscles are not affected, there should certainly be repeated examinations by an ear, nose and throat man. Dr. Sluder has proven that in a number of cases. He spends hours before he makes a diagnosis of sphenoid in this condition. A parapapillary scotoma is usually due to sinus trouble, provided in the other eye muscle conditions have been ruled out. We have symptoms of sinus involvement, pain, slight enlargement of the pupil, and scotoma even before the ophthalmoscope shows any symptoms of glaucoma. In disseminated sclerosis the blind spot is not enlarged. The paracentral scotoma may be visible in a pituitary condition, and again the blind spot is not enlarged.

Before operating upon any of these cases, we should certainly have them carefully examined by the internist, ophthalmologist, serologist, roentgenologist, and last but not least, the dentist. Then the responsibility should rest equally upon the ophthalmologist and the rhinologist.

The blind spot should be measured in all cases where the symptoms are due to eye strain. Also small central or paracentral scotomas should be sought for. In any case that has been diagnosed as a possible sphenoid or posterior ethmoid, if after irrigation and suction and shrinking with cocain, the condition does not improve, we should operate. Acute threatening cases should be operated upon at once. The prognosis depends upon how early we operate. If a case has been going on for six weeks, there may be so much atrophy that operation will do no good. In cases where we have pus, or necrosis of the bone, it is easy to make a diagnosis; but where the sclerosis has gone on for some time the diagnosis is sometimes difficult.

Dr. Harold Bailey, Springfield, Mo.—Certain cases of chronic phlyctenular inflammation, either of the cornea or conjunctiva, which resist treatment for a long time, will clear up after the removal of adenoids.

While doing an expression operation for trachoma in children, it is well at the same time to remove any existing adenoids. I have frequently

noticed in the treatment of trachoma in the adult, when improvement reaches a certain stage and goes no farther, that an examination of the nose may reveal additional pathology which seems to aggravate the trachoma.

Mild cases of epiphora and nasal duct obstruction can many times be cured by trimming the anterior end of the corresponding lower turbinate. Sometimes by fracturing the turbinate toward the septum the pressure on the outlet to the nasal duct is relieved.

Dr. Arthur I. Weil, New Orleans, La.—One of my confreres recently said to me: "I can understand how a man can practice otolaryngology without a great deal of knowledge of the eye, but I cannot understand how a man can practice ophthalmology without a thorough understanding of the nose." That is perfectly true, unless the ophthalmologist is willing to send all cases where there is the slightest suspicion of nasal involvement to the nose and throat man. A note of conservatism, however, should be sounded against operating upon all these cases, whether there is pathology present or not, on the chance of getting good results. The diagnosis is difficult, and sometimes impossible where we have no objective signs, but in bone lesions where the hyperplasia extends into the nose the diagnosis is easy enough.

A week ago a case came in to the hospital with sudden blindness in the left eye. This patient had been seen in the clinic for some time and a possible diagnosis of lues had been made. X-ray examination showed some haziness in the posterior ethmoid and sphenoid on that side. He suddenly became blind in the left eye and the natural tendency was to operate immediately upon the posterior ethmoid and sphenoid. But we waited long enough to get an opinion from a competent ophthalmologist and a competent neurologist. The fields were much diminished, but there was no scotoma. The ophthalmologist advised delay in operating upon the nose and is inclined to think there is a tumor at the apex of the orbit. The neurologist is inclined to think there is a tumor in the brain. I mention the case to show how we might have operated upon the nose when the trouble probably is in the orbit or in the brain.

Dr. M. F. Arbuckle, St. Louis, Mo.—We cannot be too careful in studying these cases.

Dr. Bailey mentioned the procedure of removing the anterior end of the lower turbinate. While of course it is at times necessary to do something with the anterior end of the lower turbinate, we should be very careful in surgery of the lower turbinate.

The first thing essential in making a diagnosis of disease in the olfactory region is to examine under proper light. The only light which is fit for post-nasal examination is an arc light. I have tried all the other electric lights that I have been able to lay hands on, and without proper light nasal examination is useless. Furthermore, without proper post-nasal examination in these cases an opinion as to whether or not the cause of an eye lesion lies in the nose is worthless.

In examining the nose for any disease of the sinuses, especially the upper cells, it is important to remember that we do not have to find a lot of pus, also that a suppurative process may be present without being demonstrable at the time of the examination. Very often, repeated examinations are required to demonstrate suppuration. On the other hand, if an inflammatory process is present, there are nearly always sufficient inflammatory changes evident to enable us to make a diagnosis of an inflammatory process.

The use of the x-ray in the study of sinus disease is indispensable to make out the size of the sinus and the contour. When it comes to deciding the fluid content of the sinuses the x-ray is as yet of very questionable value.

Dr. E. H. Cary, Dallas, Tex.—I want to report a case in which we did an autopsy, of a very large man, with a history of dilated pupils, loss of accommodation, and iritis. After examination it was impossible to determine that there was any trouble with his sinuses. We could not see any secretion anywhere. He had a meningitis and died and we did an autopsy, which showed what was apparently an encapsulated abscess within the sphenoidal cavity. Just where the third nerve passed beneath the optic nerve there was enough involvement of the bone to catch the third nerve. The third nerve paralysis was accounted for by that sphenoidal infection, and that brought about a streptococcic meningitis which killed the patient. It is the only case of the kind I have seen. There we had something that we could not bring out clinically that actually was producing an erosion by contact.

Dr. John J. Shea, Memphis, Tenn.—Dr. Heitger referred to the work of Wittmaack on the pneumatization of the temporal bone. This same process can occur in the spheno-ethmoidal labyrinth. When it does occur, any infection will more rapidly become chronic.

Dr. Ellett reported before the American Medical Association at New Orleans, in 1920, the case of a woman who had lost her vision completely. There was not even light preception. The cause of her optic neuritis was a pan-sinusitis. After a complete exenteration of her ethmoids and a resection of the anterior wall of the sphenoid, her vision rapidly returned to 15/15 and has remained so for three years. I have had another case in which the vision was diminished to 10/200, due to a cyst of the left ethmoid. After exenteration of the cyst the vision returned to normal and has remained so for eighteen months. In these two cases we were able to demonstrate gross pathological changes in the eye and the sinuses.

Dr. Weiner brought before us at the Louisville meeting the work of Loeb on the ethmoid in relation to the optic nerve, and brought out that it was the last posterior ethmoid cell or sphenoid cell that really did the damage. After that we began the procedure of resecting the anterior wall of the sphenoid first, and then entering the last ethmoid cell. By exenterating the ethmoid cells from behind forward, and from above downward, we are able to do the dangerous resection in a clear field.

THE TECHNIC OF A RADICAL MASTOID*

By Frederick Emerson Hasty, M.D.,
Nashville, Tenn.

To the patient and the family physician there are at least two important phases of radical mastoid surgery. The first is to determine when the patient has reached the stage where a radical mastoid exenteration must be done. The radical mastoid has been done, or attempted, in many cases where a more simple procedure would have sufficed. Later, I hope to report upon a type of operation that is even more conservative than the Heath, and which in a series of several cases has been quite as efficacious.

The second phase concerns the patient's just right to some promise as to the final results of his operation, such as the chances of living, of health, and of the degree of hearing that he can expect to retain. The dangers of the neglected chronic discharging ear are well known, but perhaps not fully appreciated. Along with other evidences of improved health, it is not unusual for an adult to gain from fifteen to twenty pounds after a chronic mastoiditis has been cleared up. I have never found it necessary to do a radical mastoid on an ear that had useful hearing. Nor have I ever seen a case in which a radical mastoid was necessary where useful hearing remained for any considerable length of time after the operation. So in my hands it is a health and life saving procedure. I do not mean to suggest that chronic discharging ears should be neglected in the least, but I would say that they should all be cleared up either by treatment or by the proper surgery for the particular case.

The technic of a radical mastoidectomy entails more delicate features than almost any other one of our modern surgical operations. A thorough knowledge of the normal and pathological surgical anatomy of the parts to be dealt with is essential. Otherwise, the results will often be unsatisfactory and discouraging.

The steps in the actual doing of the operation are as follows: Stand above the head of the patient and begin the incision at a point opposite the external surface of the tip of the mastoid process. Hold the knife so as to give a slightly downward bevel to the flap, thus favoring drainage, and guarding against retention of pus in the lower angle of the cavity. Make the incision to the bone to a point opposite the superior surface of the external bony canal wall, and from here on through the skin only, leaving the temporal muscle intact. Extend the incision from the point of beginning upward and backward to one-fourth inch inside the hair line and let this relation continue to a point opposite the superior attachment of the ear.

Now carefully elevate the periosteum in the lower part of the incision toward the ear, but throughout the operation rigidly avoid the elevation of the soft tissues posterior to the incision, except to remove pathological tissue. Next, dissect the overlying tissue from the temporal muscle, which is left intact to prevent the caving-in deformity. I do not use mouth-toothed retractors of any type. They macerate the margins of the wound and bury infection in the soft tissues, thus tending to cause erysipelas, sloughing, etc.

With large hemostats grasp the periosteum at points opposite the superior canal wall and the lower attachment of the ear, and by pulling rather firmly on these produce a good exposure of the operative field. Practically all of the hemorrhage may be controlled by the folding of the flap. It is not advisable in all cases to attempt to separate all of the membranous canal in the first stage of the operation, since it often happens that the bony canal is so irregular as to make it almost impossible to separate the membrane without tearing it. In such cases, it is better to separate the membrane as the bony canal is being removed. I have purposely not advised the separation of the sternocleidomastoid muscle. It should not be molested unless existing pathology makes it necessary. This precaution very markedly decreases the chances of neck infection, and

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*Read in the Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

saves the patient practically all of the pain and discomfort of a stiff neck.

In the majority of cases, the quickest and safest way of reaching the antrum is according to the method suggested by Richards; i. e., begin by removing the posterior, superior bony canal wall, extending this excavation for a reasonable distance upward and back toward the sinus. After the cells or the pathological tissues that are always found in the region of the antrum are reached, discard the chisel or gouge for the curet, and now open the antrum and enlarge it, thus leaving a thin shallow rim of the bony canal wall. Then remove this by placing a number one sized Spratt curet in the antrum, having the cutting side against the rim of the bone and using the upper bony edge of the wound as a fulcrum. By rocking the curet from side to side, cut away a small section of the rim. This turns the antrum, the middle ear, and the bony canal into one cavity.

From now on it is the surgeon's aim to remove all diseased tissue from this newly formed cavity and to make all of its surfaces continuous, and as nearly as possible, regular and smooth. Enlarge the cavity according to a method which will lend the greatest degree of safety possible to the important structures which lie near the finished walls. There are two very important points by way of precaution in the technic of radical mastoid surgery. One is to keep the operative field absolutely clear of blood. The other is to avoid twisting or scrubbing with the sponge in the middle ear as the stapes can be easily dislocated in this way.

With a rather small Richards curet, remove the remains of the superior bony canal wall, or as it is sometimes called, the external wall of the tympanum. The dura in the middle fossa may come rather low in this region, and while one would not minimize the gravity of exposing the dura in a contaminated wound it does seem that the dura of the middle fossa offers a wonderful resistance to infection. Considerable time can be saved by keeping the middle ear packed with gauze saturated in adrenalin. Besides controlling the hemorrhage, this catches the small chips of bone. Remove the packing from time to time in order to study the landmarks.

It is well, now, to lower the facial ridge with a Richards straight curet, again using the upper bony edge of the wound for a fulcrum. Set the sharp edge to cut off a very thin shaving, and with a continuous guarded stroke, cut this shaving all the way out of the ridge, clean the curet and very carefully inspect the surface before cutting another shaving. The ridge can be safely lowered in this way at least to a level with the bony capsule of the external semi-circular canal. A certain amount of overhang in the region of the stapes should be removed, but the head of the stapes must not be caught in the bowl of the curet.

This method, if absolutely observed, makes it possible to lower the facial ridge to the greatest degree with the maximum of safety, for the following reasons. The external semi-circular canal is a land mark sure to be safe of the plane parallel to the external surface of the nerve, and the most posterior surface of the external bony canal wall is clear of the nerve. A few surgical, anatomical, and pathological facts are apropos at this point. It should be appreciated that we are here dealing with a ledge of bone which is made up of bone tissue that has a consistency of at least three or four different degrees. The plate of the bony canal wall, if not destroyed by cholesteatoma, is hard and brittle. Cholesteatoma in this region has a marked tendency to expose the facial nerve. If one is not on the alert, this exposure is not detected until late in the operation, and may not be found at all. Next to the wall plate there are a number of cells which are usually small, but a few large ones are often present and may cause one to lose control of the curet or chisel when they are cut. Just external to the external semi-circular canal there are often one or two small vessels frequently surrounded by two or three large cells. These make a weak point, so to speak, and as a result the nerve is rather vulnerable at this place. It is not so much that it will be severed, but that its wall is thin and dense and can respond to pressure in only one of two ways. It may either wholly resist it or be crushed and the fragments may be buried in the nerve,

thus resulting in swelling, infection, necrosis of the fragments, and a permanent paralysis that the surgeon may never be able to explain. To reflect a moment, the technic as outlined allows all cutting to be done on a plane practically parallel with the nerve, and if the curet is held under control, a crushing injury will not happen.

If the ossicles are in view, remove their remains with a thumb forceps, preferably pulling from behind forward, but not fishing for them in blood or granulation tissue. Now cut flush the anterior canal wall. A small exposure of the jaw joint seldom causes trouble, while irregularities in the canal wall obstruct the view of the mouth of the eustachian tube.

It is well now first to insert a probe or a very small Spratt curet, and to determine the depth of the tube to the isthmus, and the consistency of the walls. If the main part of the pathology is found in the middle ear, the membrane and bony walls of the tube will likely be quite involved. On the other hand, it may be that there is very slight change of these structures in cases where the cholesteatomous degeneration is in the mastoid proper.

It seems that otologic surgeons have, perhaps unconsciously, been prone to incriminate the eustachian tube in almost every unsuccessful result. The tube *per se* is only the cause of a persistent discharge in those cases where the surgeon fails to do complete surgery and to give the proper post-operative attention. Remove all soft tissue, either bone or mucous membrane from the mouth of the tube, obliterate the anulus and remove also the processus cochlearis and the tensor tympani muscle. We may profitably make a more analytical study of some of the causes of a discharge into the cavity that may be incorrectly credited to the tube, such as chronic paranasal sinus infection, the whole or parts of adenoids, injuries to torus tubarius, tonsils, etc., and in the mastoid cavity diseased bone that was overlooked at the operation. Frequent locations for this are the anterior root of the zygoma, the outer wall of the tympanum and the cells in the angle between the floor of the middle fossae and the sinus. A contributing cause of the trouble in the above mentioned points is allowing the cavity to fill with a thick layer of granulation tissue, so that when the pus accumulates at these places it cannot rupture through and consequently it gravitates to the apex of the cavity and there emerges, seemingly from the eustachian tube.

With a long straight bistoury not over one-eighth of an inch wide, enter at the highest point of the canal and extend the incision one-sixteenth of an inch external to the crest of the inward curvature of the canal to its lowest point. Bisect this flap so as to let two-thirds be reflected upward by one small catgut suture anchored to the tissues at the posterior superior margin of the cavity. The lower flap may be held in place by sutures or packing. Remove the cartilage and excessive tissue from both flaps.

With silkworm gut, close the entire incision, placing a small drainage in the lower angle for twenty-four hours. Pack the wound from the eustachian tube outward with iodoform gauze. Place a small piece of gauze saturated in alcohol over the line of incision. Put on a large dressing of fluff gauze and wet it with hot boric acid solution. This will prevent swelling and will add a great deal to the comfort of the patient. Cut the sutures at the end of twenty-four to forty-eight hours and remove them twenty-four hours later. Dress daily in the hospital.

DISCUSSION

Dr. John J. Shea, Memphis, Tenn.—Dr. Hasty has described an operation which is very similar to the one of Barany. The latter described his operation for the first time in this country at the meeting of the American Academy in Minneapolis. Both of these operations tend toward the conservation of the membranous canal. This type of radical operation will benefit a chronic discharge and require a shorter period to heal. In doing radical mastoid operations the bone is often sclerotic, either because it is a persistent infantile mastoid, or because of scar tissue from infections.

The use of a burr in our hands has reduced considerably the time required for radical operations.

The terminal cell in any direction is a large cell. At the tip this is of only momentary importance, but when working out cells behind the sinus, this knowledge is very convenient.

The use of paraffin gauze next to the wound will allow you a painless first dressing, which is always dreaded by the patient.

Dr. W. T. Patton, New Orleans, La.—I have always preached against the radical mastoid, because it is a serious operation in the first place, and the after results are quite often not what we hope for. If we can get the cases early, the acute or sub-acute stage, do a simple mastoid, going as far as we care into the attic, very few will come to the radical mastoid. At the end of five or six months after a radical mastoid the hearing is apparently improved; but at the end of a year it is practically abolished in most cases.

The secret of success in a radical mastoid is the absolutely cleaning out of all the disease. If we give the patient fifteen minutes more after we are through, being careful to have a dry field and get absolutely healthy bone, not scrape down the bone until a necrosis is caused, but be sure that every bit of diseased cell and every particle of diseased bone has been removed, it will materially affect our success.

A second point is getting the ridge sufficiently low to bring the two cavities as near together as possible. That is a matter of personal equation, but the more work we do, the further down we go. We cannot use the semi-circular canal as a guide all the way, because although we can start with it, as we go down the nerve comes outward and we must leave a little more ridge lower down than above.

Keeping the wound clean is another important point. We use suction frequently. In removing the ridge just over the facial nerve, I prefer a backbiting forceps, such as the Kerrison. With the curet one is apt to hit the nerve.

The Doctor did not speak of skin grafting. Recently I have tried, in a couple of cases, something recommended by a physician in Montreal, the use of dental compound. The cavity is filled with dental compound, the mould removed, the skin placed over it, then replaced in the cavity. It is left for five days, the compound taken out from behind, the wound sutured, and a very good skin graft is obtained.

If the dura is exposed at all, it is always important to make a big exposure. A small exposure opens up infection, but does not open up drainage. It has been my custom to expose a piece the size of a ten-cent piece whenever the sinuses or dura are exposed, and I have never seen any trouble. It has been argued that to expose the sinus widely helps to fill up the cavity and helps healing.

The after-care is very important: the care of the mastoid wound, keeping down granulations, and, more important, taking care of the nose and naso-pharynx to prevent reinfection, in case you have not closed off the tube.

Dr. J. F. Townsend, Charleston, S. C.—I would like to call attention to something I saw at the Surgical Congress in Boston the other day with regard to skin grafting in the radical mastoid operation. The physician of whose work I am speaking starts his operations by turning back the skin and soft tissue down to the periosteum, but does not elevate the periosteum. He then makes two incisions through the periosteum, forming a V with the apex at the external auditory canal and with a nasal elevator elevates the periosteum from the temporal bone to the edge of the external auditory canal, where he makes a pin-hole opening through the periosteum at the posterior edge of the external auditory canal. Through this opening he passes a sharp elevator, elevating the skin and the periosteum of external auditory canal to the membrana tympani and by two incisions cuts this tongue loose. That gives him a tongue of skin covering the periosteum of the external auditory canal, which he places at the bottom of the mastoid cavity, and this gives him a good start for the skin growth in the epidermitization of the mastoid cavity.

Dr. Hasty (closing).—The post-operative care of the patient is important and we can do many things to add to his comfort. I use large gauze dressings, and for three or four days the dressing is wet with some hot solution. Except in cases of labyrinthian disturbance I order a back rest the next day after the operation and let the patient out of bed after three or four days. Do not let him think he is bed-ridden. All of our cases have healed by first intention, and with one or two exceptions the scars can scarcely be detected.

I no longer attempt to do skin grafting, though the method suggested by Dr. Patton seems very good. I hope it will offer a solution of our difficulties.

Dr. Shea mentioned a very important point, and that is that all of the cells should be removed. The operation should be so complete as to leave no pathology.

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
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THE PROPOSED NATIONAL DEPARTMENT OF EDUCATION AND WELFARE

A National Department of Health has been dreamed of for years by those who believe that one of the most important functions of a government is to protect the health of its citizens. At one time it seemed that our National Government would assume its responsibility in preventing disease, because it was known that if the United States had not entered the World War, President Wilson would have recommended to Congress the establishment of a Department of Health as provided for in the Owen Bill. This would have placed a physician in the President's Cabinet as Secretary of Health.

With the change of administrations and with the Republican party platform pledged to consolidate the governmental activities dealing with health and education into one department, it was hoped that the next best thing to a Department of Health would be the establishment of a Department of Health and Education. The proposed Department of Education and Welfare will carry out in a practical way the platform pledge of the Republican party; and if the new department is created the Harding administration should be credited with a great piece of constructive legislation for the benefit of the whole people. It is hoped that Democratic senators and congressmen will support the bill providing for the new department. The fact that we cannot secure a separate Department of Health should not deter those committed to that movement from aiding in securing legislation that will materially aid in the Government's doing its duty in advancing the cause of health and education.

There are many advantages in combining governmental activities dealing with health and education and it is hoped that under the proposed plan they will be more closely correlated. Indeed, much of the achievement in public health work has been due to the education of the public regarding the causes and the prevention of the communicable diseases.

Thomas Jefferson is credited with the saying that "the present generation is already lost; educate the youth of the nation". With this idea in view he founded the University of Virginia, which he regarded as one of the outstanding achievements of his life. Jefferson was right in his opinion that the education of the boys and girls will save the future men and women from the errors of their fathers and mothers, and it is also a fact that much may be done in educating the men and women in the things they should know about personal and public hygiene.

Perhaps the new Department of Education and Welfare will accomplish more at this time than could be done by separate departments of health and education. Ultimately these two of the most important functions of the Government will become separate departments of health and education; but in the evolution of things no

doubt it is best to establish the Department of Education and Welfare. Therefore, the medical profession should give its unqualified endorsement of the proposed legislation. With the coming meetings of the state medical associations the proposed department should be endorsed by all of them. Individual physicians can help in a cause for the betterment of mankind by writing their senators and congressmen expressing approval of the bill.

OPERATIVE INJURY TO THE URETER

Many of the world's best surgeons have done irreparable injury to the ureter during gynecologic operations; and there is every reason to believe that this accident has occurred hundreds or perhaps thousands of times in cases which have not been reported. Even when this tube lies in normal relation to adjacent structures the margin of safety, that is, the distance of the ureter from the cervix uteri, is not great; and when displacement of pelvic organs by tumors, inflammations, etc., occurs, knowledge of normal anatomy is of comparatively little avail.

If the ureter presented a rounded prominence anatomically and exhibited pulsations like an artery, it could be avoided more easily. And if when opened it gave striking and immediate warning as in the case of a blood vessel, the accident would be recognized at once. Several hours or days, however, may elapse before the injury is discovered; and treatment, if instituted then, has to be undertaken at serious disadvantage.

The more common and less serious operative ureteral injury is obstruction by ligation, clamping or kinking.[1] The less frequent and more serious accident is incision or division. Elsewhere in this issue[2] a contribution from animal experimentation is made to this subject by Dr. Walter C. Jones. Several striking results follow the free opening of the ureter intraperitoneally in animals. The immediate outcome is a walling-off process carried on by the intestines, omentum, etc., just as if infective material instead of mere urine were being poured out. This local reaction dams back the urine and leads ultimately but more slowly to the same results as primary ureteral obstruction, if the animal lives long enough. There is an almost complete absence of infection of appreciable severity. One might expect the mortality, great as it is, to be higher than that reported.

The operator to whom an accident of this kind happens may not report the case because he does not care to admit that he has allowed it to occur. Or he may not even know to what to attribute the stormy convalescence through which his patient passes. It is only by keeping constantly in mind the possibility of injury to the ureter that the surgeon can reduce to a minimum the percentage of accidents.

NATIONAL NEGRO HEALTH WEEK

The Chattanooga meeting of the Southern Medical Association was the occasion for the expression by several members of serious thinking on phases of the negro problem. In his presidential address Dr. Seale Harris[3] called attention to the fact that when first brought to the States the negro possessed mean proportions: that under slavery he was developed from a box-headed, pot-bellied, spindle legged

(1) Jones, W. C.: Experimental Ligation of One Ureter with Application of Results to Clinical Gynecology. American Jour. Obst., 1914, LXX, 324-410.

(2) Jones, W. C.: Experimental Intraperitoneal Division of One Ureter. So. Med. Jour., March, 1923, XVI, 188-198.

(3) Harris, Seale: Nutrition: The Most Important Public Health Problem of Today. So. Med. Jour., December, 1922, XV, 951-965.

dwarf into a splendid physical type. It is to be regretted that no wise and benign agency has since arisen to prevent him from reversion to type. That a tendency to this reversion exists was brought out by Dr. J. Ross Snyder[2] at the same meeting.

Dr. Snyder, dealing particularly with the children of the race, stated that the number of negro mothers not nursing their babies was steadily increasing, and that malnutrition was practically universal among artificially fed negro infants, general among negro children between the first and second years, and common among older children. This is due largely to economic causes: improper feeding, poor housing and sanitary conditions, and the fact that the negro not only earns small wages but is through his ignorance of values so cheated that he spends unwisely what he has.

Vital statistics show that disease is rampant in the negro race and its death rate in some localities now exceeds its birth rate. Due to public health efforts in very recent years, in some states there has been a decrease in the death rate. Further efforts are now to be made by the institution of a National Negro Health Week to begin on Sunday, April first of this year. This will be conducted by Dr. R. R. Moton[3], Principal of Tuskegee Institute, with the cooperation of various other organizations.

The diseased negro is as much a responsibility of the white medical profession as is the diseased white man, not only because of the profession's humanitarian interest in the prolongation of the life of the negro, but because every diseased negro is a menace to many white people. He has been, and, despite the rather steady exodus to the North, will probably continue to be, a peculiarly Southern problem. There is no doubt that the Southern physician of vision will aid any attempt to educate the negro along health lines not during one week only but throughout the years. A permanent organization of white physicians and laymen for the purpose of looking after the welfare of the negro race would be a valuable outcome of this educational week.

(2) Snyder, J. Ross: The Problem of the Negro Child. So. Med. Jour., January, 1923, XVI, 8-11.

(3) Health News, U.S.P.H.S. Bulletin, February, 1923.

Book Reviews

The Medical Interpreter, a Quarterly Digest of Medicine and Surgery, Domestic and Foreign, Illustrated, Selected Practical Foreign Medical and Surgical Literature. By Albert Allemann, A.B., M.D., Principal Assistant Librarian, Surgeon-General's Library, Army Medical Museum, Editor *Index Medicus*, Editor-in-Chief, Washington, D. C. Recent Practical Advances and Attitudes in Medicine and Surgery, by Capt. J. S. Taylor, Medical Corps, in charge U. S. Navy Division of Publications, Navy Department, Washington, D. C. The Bureau of Medicine and Surgery, by J. W. Schereschewsky, Assistant Surgeon-General in charge Division of Scientific Research, Washington, D. C.; J. W. Ellis, M.D., Medical Corps, U. S. Navy, Washington, D. C.; E. R. Whitmore, B.S., M.D., George Washington University Medical School, Naval Medical School, Washington, D. C.; C. F. Bolduan, in charge Section on Public Health Education, Washington, D. C.; Wm. A Brennan, Formerly Medical Department, the John Crerar Library, Chicago, Ill.; E. M. Salmonsen, Department of Medical Science, the John Crerar Library, Chicago, Ill.; and W. L. Barnes, Special Interpreter. 72 illustrations, 2 plates, and 252 pages. Volume No. V. Washington, D. C., Chicago, New Orleans, Atlanta. Southern Branch, Atlanta, Ga. The Interpreter Publishing Co., 1922.

In his foreword the Editor-in-Chief states that the reason for publication of the work was to bring to the physician doing general practice the more important articles in the form of a digest, as it is impossible for a busy practitioner to cover the extensive literature of the present day. He also states that because the American medical journals are more accessible, more stress will be placed upon foreign periodicals.

The articles appearing in the volume are carefully selected and edited and are in the main of practical significance.

Considering the large number of excellent medical journals published in America, the policy of limiting the domestic abstracts seems of a doubtful advantage.

The contents are arranged in alphabetical order for ready reference. It should serve a useful purpose and be of real advantage for those for whom it is written.

An Introduction to the Practice of Preventive Medicine. By J. G. Fitzgerald, M.D., F.R.S.C., Professor of Hygiene and Preventive Medicine and Director Connaught Antitoxin Laboratories, University of Toronto. Assisted by Peter Gillespie, M.Sc., C.E., M.E., I.C., Professor of Applied Mechanics, University of Toronto; and H. M. Lancaster, B.A., B.Sc., Director of Division of Laboratories, Provincial Board of Health, Ontario, and Demonstrator in Sanitary Chemistry, Department of Hygiene and Preventive Medicine, University of Toronto; and Chapters by Andrew Hunter, M.A., M.B., F.R.C.S.; J. G. Cunningham, B.A., M.B., D.P.H., and R. M. Hutton, with appendix articles by various contributors. With 128 text figures and 826 pages. St. Louis: C. V. Mosby Co., 1922. Cloth, $7.50.

The modern aspects of the subject are well presented and the book is so written as to be of practical use. The book is a credit to its author and publisher and a real addition to any medical library.

Physiology and Biochemistry in Modern Medicine. By J. J. R. Macleod, M.B., Professor of Physiology, University of Toronto, Toronto, Canada. Assisted by Roy G. Pearce, A. C. Redfield, N. B. Taylor and others. Fourth edition, with 243 illustrations, including 9 plates in colors, and 970 pages. St. Louis: C. V. Mosby Co., 1922.

The present edition of Professor Macleod's valuable book has been revised and largely rewritten in order to keep it abreast of the progress that is being made in biochemical research. In no other branch of medicine are discoveries and advances being made so rapidly. But this book thoroughly covers the field up to the time of publication and discusses many subjects now under investigation.

To those who know Dr. Macleod's work it suffices to state that a new edition is available. The physician who wishes to keep in step with advances in modern medicine, and who has not studied this work, can rest assured that the money and time spent on this book will prove the cheapest and most profitable post-graduate course that he can take.

The Pirquet System of Nutrition. By Dr. Clemens Pirquet, Professor of Pediatrics, University of Vienna, Austria. 96 pages. Philadelphia and London: W. B. Saunders Co., 1922. Cloth, $3.00.

This brief book contains the principal facts and the practical application of the well-known Pirquet theories. It also has a complete bibliography of the subject from the years 1917-1922, the values of the principal food stuffs, and a table of Pelidisi Indices. It will be very useful to the general practitioner and to all those who wish to fix in their minds the outlines of the system.

Manual of the Diseases of the Eye. For students and general practitioners. By Charles H. May, M.D., Director and Visiting Surgeon, Eye Service, Bellevue Hospital, New York; Attending Ophthalmic Surgeon to the Mt. Sinai Hospital, New York; Consulting Ophthalmologist to the French Hospital, New York, and to the Monmouth Memorial Hospital; Formerly Chief of Clinic and Instructor in Ophthalmology, College of Physicians and Surgeons, Medical Department, Columbia University, New York. Tenth Edition Revised. With 377 original illustrations, including 22 colored figures. New York: William Wood & Co., 1922. Cloth, $3.50.

The author has endeavored in this edition, as in the past, to give the fundamental facts of ophthalmology and to cover all that is essential in this branch of medicine, always keeping in mind that the book has been written for students and general practitioners. Space, therefore, has been allotted as the necessities of such readers require, estimated by an extended experience in teaching. Thus, rare conditions have merely been mentioned; uncommon affections, of interest chiefly to the specialist, have been dismissed with a few lines; and common diseases, which the general practitioner is most frequently called upon to treat, have been described with comparative fullness. The book is not recommended as a substitute for the larger works, but as a means of supplying a foundation to which further knowledge may be added by reference to more extensive and comprehensive textbooks.

An Index of Prognosis and End-Results of Treatment. By Various Writers. Edited by A. Rendle Short, M.D., B.S., B.SC., (Lond.), F.R.C.S. (Eng.); Member of Council British Association of Surgeons; Hon. Surgeon, British Royal Infirmary; Examiner for the First F.R.C.S.; Lecturer in Physiology, University of Bristol. Third edition, revised and enlarged. 594 pages. New York: William Wood & Co., 1922. Cloth, $12.00.

This volume is a companion to the "Index of Differential Diagnosis" by the same publishers.

The more important medical and surgical conditions are arranged in alphabetical order and these are ably discussed. The authors of the different sections are well chosen and their manner of presentation of the individual subjects adequate and in accordance with modern teachings.

The Practical Medicine Series. Chas. L. Mix, A.M., M.D., General Editor. Vol. I, Series of 1922. General Medicine. Edited by Geo. H. Weaver, M.D.; Lawrason Brown, M.D.; Robert B. Preble, A.M., M.D.; Bertram W. Sippy, M.D.; and Ralph C. Brown, B.S., M.D. 715 pages. Illustrated. Chicago: The Year Book Publishers, 1923.

A resume of medical literature during 1922. Of special value is the review of diseases of the chest by Lawrason Brown, and also the review of the literature of heart and blood vessels, by Preble.

Epidemiology and Public Health. A Text Book for Physicians, Medical Students and Health Workers. In three volumes, by Victor Vaughan, M. D., LL.D., Chairman Division on Medical Sciences, National Research Council; Emeritus Professor of Hygiene, University of Michigan, Assisted by Henry F. Vaughan, M. D., Dr. P. H., Commissioner of Health, City of Detroit; and George T. Palmer, M.S., Dr. P. H., Epidemiologist for Department of Health, City of Detroit. Vol. 1. Respiratory Infections. 668 pages, 83 text figures and 86 tables. St. Louis: C. V. Mosby Co., 1922. Cloth, $9.00.

The book is divided into twenty chapters on respiratory infections.

Certain sections stand out more prominently than others because of the recent experiences of the mobilization of the World War. Thus the accounts of the pneumonias, influenza, measles, and cerebro-spinal meningitis are given in greater detail than other subjects on which there has not been the recent intensive study. The section on poliomyelitis is also given in detail, as well as diphtheria, but in this later section it is to be regretted that the author did not give a brief discussion of the methods advised for sterilization of diphtheria carriers.

The book is pleasingly written, clearly expressed, and above all, the author always presents the data from which he draws his deductions.

The Principles of Electrotherapy and Their Practical Application. By W. J. Turrell, M.A., D.M., B.Ch. (Oxon), D.M.R.&E. (Constab.), Consulting Physician Oxford County and City Mental Hospital; Physician in Charge, Physiotherapy Department, Radcliffe Infirmary, Oxford, England, etc. Illustrated. 276 pages. New York: Oxford University Press, 1922. Cloth, $3.85.

The opening chapter on "The Therapeutic Action of the Constant Current" brings out the contrast between the old and the new ideas in this field of medicine.

The contrast with the average book of this type is quite refreshing, owing to its conservatism, as most electrotherapeutic works make exaggerated claims.

His discourse on the therapeutic action of the ultra violet and the x-rays, first by giving an accurate description of what each wave is, and then its function in health and disease, is well handled.

That section dealing with electro-diagnosis, while a recapitulation, is worthy of mention.

At this stage of medicine a book of this kind should be studied by every physician, for electricity is proving more and more an asset to the science.

Getting Ready to Be a Mother. A Little Book of Information and Advice for the Young Woman Who is Looking Forward to Motherhood. By Carolyn Conant van Blarcom, R.N., Author of "Obstetrical Nursing", "The Midwife in England". Formerly Assistant Superintendent and Instructor in Obstetrical Nursing and Care of Infants and Children, Johns Hopkins Hospital Training School for Nurses; Honorary Member Midwives' Institute, England. With an introduction by J. Clifton Edgar, M.D., Emeritus Professor of Obstetrics and Clinical Midwifery, Cornell University Medical College; Consulting Obstetrician, Bellevue Hospital; Surgeon, Manhattan Maternity and Dispensary; Consulting Obstetrician, New York Maternity, Jewish Maternity and Greenwich General Hospitals. And Frederick W. Rice, M.D., Associate Professor of Obstetrics N. Y. University and Bellevue Hospital Medical College; Consulting Obstetrician Bellevue Hospital; Assistant Surgeon, Manhattan Maternity and Dispensary; Assistant Surgeon St. Bartholomew's Clinic and Hospital. With 70 illustrations and 237 pages. New York: The Macmillan Co., 1922. Cloth, $1.50.

A splendid book upon a subject too often abused by sentimental or ignorant handling.

Arab Medicine and Surgery: A Study of the Healing Art in Algeria. By M. W. Hilton Simpson, B.Sc., Author of "Among the Hill Folk of Algeria," etc. New York: Oxford University Press, 1922. Cloth $3.50.

The author is a layman who was so fortunate as to have access to many of the secrets of the reticent physicians of Algeria. The fact that he is a physician is concealed jealously from most foreigners by the native Arab practitioner. Although superstitious and voodooistic customs prevail, these men have also a fund of antiquated information. The illustrations in the book are interesting. Many surgical, dental, and ophthalmic instruments are shown, and the materia medica is discussed. The book does not attempt to bring out anything to advance medicine, but to depict the crude state of Algerian medicine and surgery.

Generalized Pain. Part II of the Clinical Symptomatology of Internal Diseases. By Prof. Dr. Norbert Ortner, Vienna. Only Authorized Translation into the English Language of the Second German Edition, by Frances J. Rebman, with an Introduction by Thomas Webster Edgar, M.D., New York. 596 pages. New York: Medical Art Agency, 1922.

This book discusses the symptomatology of all pain except that in the abdominal region which has been fully dealt with in another book. The translation is accurate, though for clearness some of the involved German sentences have been shortened.

The subject of pain in every part is thoroughly covered, and practically every possibility suggested by headache, articular pain, pains in the chest, shoulder, heart region, neck, back, etc, is analyzed. Owing to the rapidity with which the entire subject is covered, the style of the book is not literary but rather a series of tabulatory paragraphs into which the author has crowded masses of facts from a wide clinical experience. It is a useful compilation and reference book.

The Practice of Surgery. By Russell Howard, C.B.E., M.S. (Lond.), F.R.C.S. (Eng.), Surgeon, London Hospital; Senior Surgeon, Poplar Hospital; Lecturer on Surgery and Teacher of Operative Surgery, London Hospital Medical College. Author of "Surgical Nursing," "The House Surgeon's Vade Mecum," etc., with 8 colored plates and 542 illustrations in the text of 1285 pages. Third edition. Philadelphia: J. B. Lippincott Co. London: Edward Arnold & Co., 1922.

This is a worth-while text book of surgery, though it is aimed to describe chiefly surgery as taught and practiced at the London Hospital. In this edition, the sections upon injury to the nerves, x-ray in the diagnosis of diseases of the stomach, duodenum and colon, upon fractures and injuries, upon syphilis and other parts have been greatly amplified.

Recipes for Institutions. Collected and edited by the Chicago Dietetic Association, Inc. For the Interest of Better Food for the Institutions. 163 pages. New York: The Macmillan Co., 1922.

As the title indicates, this is a book primarily for dieticians, which will prove practical, as it represents recipes from 70 dieticians of the leading hospitals in the United States. "The proof of the pudding is in the eating," so this is sufficient recommendation for those interested in this subject.

A Text Book of the Practice of Medicine, Oxford Medical Publication. By various authors. Edited by Frederick W. Price, M.D., F.R.S. (Edin.), Senior Physician, The Royal Northern Hospital; Physician, National Hospital for Diseases of the Heart, London; Formerly Physician and Honorary Pathologist, Mount Vernon Hospital for Consumption and Diseases of the Chest; and Examiner in Medicine, University of St. Andrew. 96 text figures and 1753 pages. New York: Oxford University Press, 1922.

The editor has assigned certain subjects to the different contributors, and at times it is apparent that they have been restricted as to space.

The sections on infectious diseases are not clearly written and give the impression that the authors were hurried.

Certain of the contributors stand out for the clearness of their presentation of their subjects. Tropical Medicine, by Geo. B. Low; Gastroenterology, by Arthur F. Hurst; and Trench Fever, by Lieut.-Col. Byam, being the ones worthy of mention.

The fact that the editor has included a section on skin diseases and psychological medicine departs from the purpose of the book.

Taking the work as a whole, although there are some good portions, it is difficult to see why it was published, as there are so many other text books on the same subject which cover the ground far more satisfactorily.

Vital Statistics. An introduction to the Science of Demography. By George Chandler Whipple, Professor of Sanitary Engineering, Harvard University; Member of Public Health Council, Massachusetts State Department of Public Health. Second Edition. 163 tables. 579 pages. New York: John Wiley & Sons, Inc., 1923. Cloth, $4.00.

This small volume, which was originally prepared for students of Harvard University and the Massachusetts Institute of Technology, is presented in text-book style by one who is the acknowledged authority on sanitary engineering.

The title sounds dull to one not directly engaged in work involving its use. However, Whipple has taken what is ordinarily regarded as a dry subject and has imparted to it a charm which is a revelation to the skeptical. It will open up a new field to any one willing to study it.

Other Books Received

The Causes of Heart Failure—(Harvard Health Talks.) By William Henry Robey, M.D., Assistant Professor of Medicine, Harvard University; Visiting Physician, Boston City Hospital. With 45 pages. Cambridge: Harvard University Press. London: Humphrey Milford, 1922. Cloth, $1.00.

Outlines of General Biology. An Introductory Laboratory Manual. By Charles W. Hargitt, Research Professor of Zoology in Syracuse University and George T. Hargitt, Professor of Zoology in Syracuse University. With 177 pages. Fourth Edition. Philadelphia and New York: Lea & Febiger, 1922. Cloth, $2.00.

Mental Deficiency (Amentia). By A. F. Tregold, M.D., M.R.C.P., F.R.S. (Ed.), Lecturer on Mental Deficiency, London University, Physician to Out-Patient Department and Lecturer at Bethelm Hospital; Physician and Neurologist, Royal Surry County Hospital, etc. Fourth edition, revised and enlarged. Frontispiece and 30 plates. 569 pages. New York: William Wood & Co., 1922. Cloth, $6.00.

A Clinical Treatise on Diabetes Mellitus. By Marcel Labbe, M.D., Professor of General Pathology, Faculty of Medicine, Paris; Physician the Charite Hospital, etc. Translated, Revised and Edited by Charles Green Cumston, M. D., Lecturer Faculty of Medicine of the University of Geneva; Fellow Royal Society of Medicine, London, etc. With four new chapters by the author and three by the editor not included in French edition. 382 pages. New York: William Wood & Co., 1922. Cloth, $5.00.

Principles and Practice of X-Ray Technic for Diagnosis. By John A. Metzger, M.D., Roentgenologist, School for Graduates of Medicine, Medical Department, University of California, Southern Division, Los Angeles, Calif. 161 illustrations. 144 pages. St. Louis: C. V. Mosby Co., 1922. Cloth, $2.35.

Southern Medical News

HOME-COMING MEETING OF THE SOUTH CAROLINA STATE MEDICAL ASSOCIATION

The South Carolina State Medical Association will celebrate the seventy-fifth anniversary of the founding of the Association with a "home-coming" meeting to be held in Charleston, April 17-18-19, 1923. Among the distinguished guests who will address this meeting are: Dr. W. S. Leathers, Jackson, Miss., President of the Southern Medical Association, and Dr. C. C. Bass, New Orleans, La., Dean of the Medical Department of Tulane University. The Association hopes to have at this "home-coming" meeting every doctor who has ever lived in South Carolina. Dr. E. A. Hines, Secretary, Seneca, S. C., wants your name if you are a former South Carolinian.

ALABAMA

Jefferson County Medical Society has elected Dr. R. H. Hamrick, President; Dr. E. L. Scott, Vice-President; Dr. W. B. Hardy, Secretary-Treasurer.

Plans are being made to erect a maternity wing to the Albany Hospital as a memorial to the late Dr. M. W. Murray, Albany. The estimated cost of the annex will be $50,000.

The personnel of the Tennessee Valley Laboratory, which recently opened in Decatur, is as follows: Dr. H. C. McRae, County Health Officer; Col. W. D. Wrightson, Federal Sanitary Engineer; Miss Nina Elderidge, Technician; Mrs. Vera Austell, Accountant; Miss Ella Dale, County Health Nurse; Miss Brockway, Assistant to Miss Elderidge; J. M. Holly, Sanitary Inspector.

At a recent meeting of the State Board of Health in Montgomery, resolutions were passed paying tribute to Dr. S. W. Welch, State Health Officer, for educating the people to the extent that the death rate in Alabama from infectious diseases had been materially lowered.

Dr. John Long, formerly with the U. S. Army, stationed at Fort Sill, Okla., has taken up his duties as head of the x-ray department of the Colbert County Hospital, Sheffield.

Lauderdale County Medical Society has elected Dr. A. A. Jackson, President; Dr. Harry Simpson, Vice-President; Dr. W. D. Hubbard, Secretary; Dr. P. I. Price, member Board of Censors.

Dr. J. D. Dowling, Health Officer of Birmingham, and Dr. George A. Cryer, Health Officer of Calhoun County, have been appointed members of the Royal Institute of Public Health of Great Britain.

Deaths

Dr. Martin Luther Malloy, Eutaw, aged 47, died December 27 in a Tuscaloosa hospital as a result of stab wounds.

Dr. William Walne Wallace, Birmingham, aged 25, died December 27 from influenzal pneumonia.

Dr. James Spencer Mackey, Rogersville, aged 46, died December 18 from pneumonia.

ARKANSAS

Benton County Medical Society has elected Dr. T. E. Hodges, Rogers, President; Dr. C. S. Wilson, Gentry, Vice-President; Dr. C. A. Rice, Rogers, Secretary-Treasurer.

Craighead County Medical Society has elected Dr. O. V. Smith, President; Dr. R. W. Ratcliff, Vice-President; Dr. Thad Cothern, Secretary; Dr. J. T. Altman, Treasurer.

Drew County Medical Society has elected Dr. E. R. Cotham, President; Dr. M. Y. Pope, Vice-President; Dr. F. L. Duckworth, Secretary.

Faulkner County Medical Society has elected Dr. N. E. Fraser, President; Dr. J. E. McMahan, Vice-President; Dr. J. S. Westerfield, Secretary-Treasurer.

Hempstead County Medical Society has elected the following officers: Dr. J. H. Weaver, President; Dr. G. E. Cannon, Vice-President; Dr. M. V. Russell, Secretary.

Independence County Medical Society has elected Dr. T. N. Rodman, President; Dr. I. M. Huskey, Vice-President; Dr. M. S. Craig, Secretary-Treasurer.

Miller County Medical Society has elected Dr. R. H. T. Mann, President; Dr. F. M. Lennard, Vice-President; Dr. H. E. Murry, Secretary.

Mississippi County Medical Society has elected Dr. J. A. Saliba, Blytheville, President; Dr. O. Barksdale, Wilson, Vice-President; Dr. F. D. Smith, Blytheville, re-elected Secretary.

Saline County Medical Society has elected Dr. Dewell Gann, President; Dr. J. M. Phillips, Secretary.

Plans have been announced for the erection of an annex to the Warner-Brown Hospital, El Dorado, at a cost of $160,000. Paul Brown donated the present building and will erect the addition.

Officers elected for the State School Directors' Association are Dr. Chas. S. Holt, Fort Smith, President; Dr. B. D. Luck, Pine Bluff, Vice-President.

Dr. C. A. Williams, El Dorado, has been appointed full-time health officer, succeeding Dr. S. J. McGraw, who resigned as head of the health board.

Deaths

Dr. Zaphney Orto, Pine Bluff, aged 80, died January 22.

Dr. Charles McRae Morgan, Tucker, aged 50, died January 14.

Dr. Vardiman M. O. McDowell, North Little Rock, aged 65, died December 18.

Dr. C. A. Mitchell, Sheridan, aged 66, died January 1, after a long illness.

DISTRICT OF COLUMBIA

A bill introduced by Representative Fess, by which an appropriation of $150,000 is made as part contribution toward a memorial building in the District of Columbia to commemorate the services and sacrifices of the patriotic women of the United States during the World War, stipulates that the memorial shall cost $300,000 and that it shall be used as a permanent model chapter house of the American Red Cross under charge of the District of Columbia chapter.

The Women's Welfare Association, Washington, recently opened a special clinic for the treatment of asthma and hay fever in young people, as the first step in the anti-asthma campaign for the benefit of young girls. The clinic will be held every Friday.

Deaths

Dr. Horace Benjamin Coblentz, Washington, aged 51, died January 24 from heart disease.

Dr. John H. Metzerott, Washington, aged 57, died January 3 at the Sibley Memorial Hospital following an operation.

Dr. Francis B. Loring, Washington, aged 72, died January 14.

FLORIDA

Duval County Medical Society has elected Dr. John E. Boyd, President; Dr. Elmo D. French, Vice-President; Dr. Francis A. Copp, Secretary; Dr. John K. Norwood, re-elected Treasurer.

GEORGIA

The 240 members of the Atlanta Dental Society are cooperating in a drive for better teeth among school children, each dentist treating, free of charge, at least one child. The portable dental clinic of the Atlanta public schools reported 11,669 children with defective teeth among pupils of nine public schools examined recently.

Dr. Roger C. Swint has been appointed Superintendent of the Georgia State Sanatorium, Milledgeville, succeeding the late Dr. L. M. Jones.

Dr. Thomas W. Reid, Jr., Thomasville, has been appointed Physician to Thomas County.

Dr. W. W. Crook, Cuthbert, is taking a six weeks' post-graduate course in New Orleans.

Dr. G. Y. Moore, Cuthbert, was recently elected Health Physician, succeeding Dr. F. D. Patterson.

Dr. F. M. Martin, Shellman, and Dr. J. C. Patterson, Cuthbert, are taking a post-graduate course in New Orleans.

Dr. Alice Moses, Atlanta, has been appointed Director of Child Hygiene of Georgia under the State Department of Health, succeeding Dr. Dorothy Bocker, who has returned to her home in New York.

Bartow County Medical Society has elected Dr. R. P. Adams, Bethelehem, President; Dr. S. T. Ross, Winder, Vice-President; Dr. W. T. Randolph, Winder, Secretary-Treasurer.

Clarke County Medical Society has elected Dr. A. A. Rayle, President; Dr. H. I. Reynolds, Vice-President; Dr. Joseph S. Stewart, Jr., Secretary-Treasurer.

Dr. Conrad E. Keorper has resigned as Acting Health Officer of Savannah.

Dr. Lehman William Williams and Miss Metta Martha Harr, both of Savannah, were married November 22.

Dr. Julian Holt Buff and Miss Joyce Louise White, both of Atlanta, were married January 4.

(Continued on page 38)

Dr. Walter A. Weed

Wishes to announce the installation of a 280,000 Volt Deep Treatment X-ray Transformer with modern accessory equipment as a further acquisition to his treatment facilities.

RADIUM AND X-RAY LABORATORIES

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

THE DIAGNOSIS OF ABDOMINAL ADHESIONS*

BY C. W. STRICKLER, M.D.,
Atlanta, Ga.

The profession, generally, appears to have a very clear conception of post-operative adhesions and those resulting from acute inflammations within the abdomen. A good many, however, seem to have overlooked the fact that congenital bands and adherences are very common and that others are formed as we grow older, as shown by Bryant[1] and others. Proof of this unfamiliarity is found in the diversity of opinions given and the treatment advised for relief.

The most frequent diagnoses are as follows: neurasthenia, hypochondriasis, aerophagia, sitophobia, gastric hyperacidity, duodenal and gastric ulcer, gastroptosis, mucous colitis, and chronic appendicitis.

Chronic appendicitis in the sense this term is commonly used may or may not be present. If so, it forms only a part of the clinical picture. The removal of this organ fails to give relief in many instances, as shown by Lichty,[2] and the futility of such a surgical procedure is emphasized by Westmoreland.[3] Symptomatology referred to the gall bladder is another fruitful source of error. We have seen appendices removed and gall bladders drained without the slightest relief and, in a small percentage of cases, the condition is apparently made even worse. If time permitted, we could give cases that have had all kinds of abdominal operations for the relief of symptoms presently to be given, without any permanent benefit.

If we eliminate visceroptosis, which can be easily done, the symptomatology is almost classical. The story is so nearly the same that the diagnosis can be almost positively made from the history as given. Gas, abdominal pains, extreme nervousness, weariness or fatigue, apprehension, symptoms referred to the heart and, usually, constipation, constitute the chief complaints. In addition, different ones had one or more of the following conditions: acid stomach, repeated attacks of acidosis, irritability, insomnia, nausea, nausea and vomiting, dizziness, mental depression, headache and drowsiness. Of these the most distressing were gas, nervousness, fatigue and apprehension. Fear that so much gas would form that its pressure on the heart, as they believed, would cause it to stop beating made some afraid to be alone, especially after meals.

Strange as it may seem, we have seen several of these cases lose control over themselves and weep because of the extreme fatigue from which they suffered. One case had been in bed the greater part of two years, claiming she was too weak to get up, but after having had the necessary corrective operation she was able to be up and showed marked and continued

*Read in Section on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

improvement. Nearly all these patients complain of being nervous. In a few this symptom was very distressing, in fact being so marked that it overshadowed all other complaints and, but for the physical findings, we would have been led astray.

The power of initiation is largely lost and, as Westmoreland states, in many, it seems to require as much effort "to start as to perform." These patients are much brighter and freer from symptoms during the morning hours and grow worse as the day advances. Frequently the morning meal starts the day's unpleasantness. They are most unhappy during the afternoon and evening and often lie awake because of excessive tympanites, nervousness or fancied cardiac disease. There is thus formed a vicious circle which can only be broken by the removal of the underlying pathology.

Two types of cases have come under our observation, the one very well nourished and appearing to be in good health; the other pale, emaciated and care-worn. The former looked so well and reflected so little the picture of suffering that they failed, as a result, to receive any sympathy from family or friends and, therefore, delayed consulting a physician until, as they state, "they had to have relief." The latter were in their present state of health mainly because of starvation, preferring this condition rather than the suffering consequent upon eating a normal meal. Many had been put on milk diets or had been given rest cures with apparent restoration to health, but upon taking up their former manner of life with its stress and duties they soon suffered a relapse and were before a great while in their former physical condition. Occasionally other conditions of minor importance were found. Examination of the heart usually revealed, in cases suffering with this organ, occasional extra systoles and either the presence or history of paroxysmal tachycardia.

The examination of the abdomen did not, as a rule, show sufficient distention to be a cause of complaint. Collections behind the constrictions or angulations could be detected and often be forced to pass by the palpating fingers, and at the time the patient stated that this passage of gas caused relief if suffering. There was distinct muscle rigidity over the location of the adhesions or bands. Of this we are quite sure because we either had reports of or witnessed the operations. Some were sensitive to pressure, others not. Occasionally marked rigidity was lacking but, if so, a few days of forced feeding with rough foodstuffs would establish the usual physical findings.

It might be claimed that the unyielding abdominal wall was more marked when the appendix was involved, but such is not the case. Several of the worst cases we have had revealed little or no microscopical pathology of this organ. Occasionally in the cases of those suffering with transient nausea, deep pressure would elicit this symptom. The x-ray was helpful in eliminating gastric and duodenal ulcer, in locating points of stasis, revealing angulations and constrictions and in locating the position of the appendix and the mobility and position of the gut. However, too much dependence cannot be placed upon this procedure, as the following two cases, taken from a number, will illustrate:

One was examined in two of the best clinics in this Country and pronounced normal in every way, was advised to rest and seek diversion, but, when this advice was followed, obtained no relief. An operation revealed a rather wide band, causing rotations and angulations of the duodenum near the pylorus.

Another, because of a plainly to be seen and constant constriction of the descending colon just below the splenic flexure, was diagnosed stricture of the colon. However, despite this diagnosis and the fact that the location of greatest pain was at this point, we were inclined to consider this a reflex spasm for the reason that all the physical findings were on the opposite side. This was proven at operation. Both these cases have been relieved and are showing continued improvement.

In conclusion, I might say that the majority of these cases are curable if operated upon by a surgeon who understands the development and rotation of the gut with the abnormalities as described by Huntington[4] and who makes an incision of sufficient length to view his work. I wish to place especial emphasis here, for the reason that the smaller and more or less obscure adhesions give even more trouble than the large ones. Following this surgical procedure, these pa-

tients should have the care of a competent clinician until health is fully restored. If this could be done in all cases, failures would be conspicuous by their absence and many of the so-called "abdominal invalids" would have something worth while done for their relief.

The length of time necessary to obtain the desired results depends upon the number of months or years the patient has suffered from the distressing symptoms. In our experience relief has come to some cases within a few weeks; in others of long standing, two years are required for complete restoration to health.

ILLUSTRATIVE FINDINGS IN TWO CASES OPERATED UPON BY DR. W. F. WESTMORELAND

Case I.—There was a retrocecal appendix. The ileocecal fold was obliquely drawn forward to the mesentery of the appendix, infolding the ileum on itself. The hepatic flexure was almost occluded by the omentum's growing across, both over and under, the ascending colon at this point to the parietal peritoneum, firmly fixing as well as occluding almost completely the colon at the flexure at this point.

Case II.—The cecum was mobile, but with displacement of the ileocecal fold, which obliterated the ileocecal fossa and blended with the mesentery of the appendix and a remnant of the ovarian or Reid's ligament. The cecum and ascending colon in this case was so large and dilated that it looked like a case of Hirschsprung's disease. In this case the colon was almost occluded by a small tight band around the hepatic flexure arising from the parietal peritoneum and growing around the colon as a small suspensory ligament, back to its point of origin. The fold of the colon concealed this band, but the enormous distension of the colon showed there must be some constriction at this point and it was discovered by the examining fingers. When the ileocecal fossa was opened up along the line of cleavage and the ileocecal fold removed, the ileum was lengthened about two inches, with no raw surface.

The patient had two ovaries with blood cysts and both ovaries and tubes had to be removed. There was a bad retro-flexion and the uterus had a ventral suspension. She also had one of the tightest anal fissures I ever stretched, with a large part callous ulcer. There was about as much surgery in this case as I have ever done on one patient, but she has had a comfortable, uneventful recovery. This is the first of these tight bands completely encircling the gut that I have seen.

ILLUSTRATIVE FINDINGS IN A CASE OPERATED UPON BY DR. LEROY W. CHILDS

A five-inch incision with the umbilicus as the middle point was made over the right rectus muscle. The muscle was exposed and displaced from its sheath toward the middle line. The abdomen was opened. Exploration of the right ileac region showed a Jackson's veil obscuring the appendix which had become adherent to the cecum, causing it to rotate inwardly and posteriorly. This adhesion, which had caused rotation of the cecum, caused the small bowel to enter the large bowel in such a manner as to kink the former between one and two inches from the ileocecal valve. The adhesions were carefully separated, the appendix removed and all raw surfaces covered as completely as possible. Exploration of the stomach, liver and gall bladder showed these organs negative, although the liver was two finger breadths below the rib margin. There was no pathology in the upper abdomen. The abdomen was closed without drainage.

REPORT OF CASE HAVING HAD PREVIOUS OPERATION FOR APPENDICITIS WITHOUT RELIEF, BY DR. L. SAGE HARDIN

The lower border of the liver and the pyloric portion of the stomach were at the upper naval margin. There was a scar running from the gall bladder sulcus to the falsiform ligament on the front of the liver and omental adhesions to the abdominal wall at the site of the previous operation. These were resected, the proximal end inverted and the distal end turned into the abdominal wall during closure. There was a band one-fourth inch wide passing from the anterior portion of the colon about its middle third to the abdominal wall, producing a constriction at this point. This was cut and the end covered under the peritoneum. A second and distinct band, rather dense, was found attached to the first portion of the transverse colon, holding it well back onto the ascending colon and thence across to the abdominal wall. When this was cut and the raw surface covered under the peritoneum, the hepatic flexure assumed its normal pleasant curve under the liver. Another band running from the stomach prepyloric to the duodenum and thence to the transverse colon, held forward the duodenum, producing an obstruction and resulting in a decided enlargement. This was incised and the raw surface turned back onto the stomach and transverse colon. There was a general thin Jackson's veil covering over the whole duodenum and transverse colon at this point.

The pyloric muscles proper were very heavy and the stomach muscles markedly hypertrophied. Hence, to relieve the retraction that would take place at this point, a small Finney pyloroplasty was done. The abdominal peritoneum was closed, everted. The patient returned to the bed in good condition without shock, with pulse of 108, and was placed in the Trendelenberg position to allow the viscera to assume the normal position in the upper abdomen.

FIFTY ILLUSTRATIVE CASES

No. 1.—Age, 43 years. Previous operations, appendectomy. Enucleation of fibroid of uterus. Results, no relief. Chief complaint, abdominal pain. Nervousness. Insomnia. Hysteria. Tachycardia. Occasional nausea and vomiting. Constipation. Duration, several years. Result following operation, greatly improved. Gain in weight of 30 pounds.

No. 2.—Age, 50 years. Previous operations, none. Chief complaint, gas, tachycardia, nausea, occasional vomiting, constipation, nervousness. Duration, several months. Result following operation, cured.

No. 3.—Age, 50 years. Previous operations, none. Chief complaint, extreme nervousness, gas, tachycardia, fatigue, constipation. Duration, several years. Result following operation, cured.

No. 4.—Age, 20 years. Previous operations, none. Chief complaint, nervousness, weakness, bodily pain, palpitation, much gas, some abdominal pain, frequent eructation, constipation. Duration, several months. Result following operation, cured.

No. 5.—Age, 37 years. Previous operations, right kidney anchored. Results, condition worse since. Chief complaint, nervousness, insomnia, weakness, tachycardia, depression, painful joints. In this case bowels were irregular. Duration, several years. Result following operation, greatly improved.

No. 6.—Age, 24 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, burning, fullness and uncomfortable feeling in stomach; some nausea; constipated. Duration, several years. Result following operation, cured.

No. 7.—Age, 19 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, insomnia, pain in right side of abdomen, weariness. An acute attack of nausea and vomiting. Duration, about two months. Result following operation, cured.

No. 8.—Age, 23 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, indigestion, localized gastric pain, small area below ensiform cartilage, very severe after eating; nervousness, weakness; had several rest cures. Duration, four years. Results following operation, improved. Refused rest cure, hence imperfect result.

No. 9.—Age, 51 years. Previous operations, none. Chief complaint, gas, slight pain across upper abdomen, constipation. Duration, two years. Results following operation, greatly improved. Left hospital and refused to carry out directions.

No. 10.—Age, 37 years. Previous operations, has had peritonitis, suspension of uterus, removal of right ovary, adhesions broken up, fistulo-in-ano. Results, no relief. Chief complaint, nervousness, weakness, indigestion, gas, occasional nausea and vomiting, acidosis. Duration, several years. Results following operation, relieved of all symptoms; apparently cured.

No. 11.—Age, 32 years. Previous operations, tonsillectomy and adenoids. Results, not given. Chief complaint, gaseous distention, belching and regurgitation of food; weariness, depression, constipation. Duration, six years. Result following operation, cured.

No. 12.—Age, 29 years. Previous operations, none. Chief complaint, nervousness, insomnia, gastric discomfort after eating. Duration, six months. Result following operation, cured.

No. 13.—Age, 46 years. Previous operations, none. Chief complaint, nervousness, fatigue, discomfort right side of abdomen, insomnia, constipation. Duration, seven years. Result following operation, cured.

No. 14.—Age, 24 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, bilious attacks, bad taste in mouth in morning, gas, regurgitation of food, fatigue. Duration, one year. Result following operation, operated upon in another city; report from physician satisfactory.

No. 15.—Age, 8 years. Previous operations, none. Chief complaint, frequent attacks of acidosis, in three of which she had convulsions; constipation, very nervous, transient glycosuria. Duration, five and a half years. Result following operation, improved.

No. 16.—Age, 49 years. Previous operations, appendectomy 25 years previously. Results, no relief. Chief complaint, abdominal pain, distension—worse since his operation; tachycardia. Duration, 25 years. Result following operation, cured.

No. 17.—Age, 39 years. Previous operations, appendectomy. Results, no relief. Chief complaint, fear of crowds, constant headaches, marked fatigue, mucus in stools, marked irritability, pain in right leg and hip. Duration, several years. Result following operation, greatly improved. Good results expected. Delayed, due to patient's having to return to work too early.

No. 18.—Age, 27 years. Previous operations, none. Chief complaint, eructation and gas, occasional nausea. Bowels fairly regular. Duration, one and a half years. Result following operation, cured.

No. 19.—Age, 56 years. Previous operations, none. Chief complaint, fullness in stomach after eating, gas, acid stomach, extremely nervous. Duration, several years. Result following operation, cured.

No. 20.—Age, 26 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, constant headache, very nervous, indigestion and heart burn, much gas; feels as if she would faint easily; insomnia. Duration, five years. Result following operation, cured.

No. 21.—Age, 30 years. Previous operations, none. Chief complaint, nausea after eating, gas, backache and sensation of weight over pelvic region. Duration, several years. Result following operation, cured.

No. 22.—Age, 39 years. Previous operations, appendectomy. Results, not given. Chief complaint, gas, nausea and vomiting. Duration, several years. Result following operation, cured.

No. 23.—Age, 41 years. Previous operations, herniotomy, tonsillectomy, some nasal operation. Results, not given. Chief complaint, nervousness, insomnia, dull pain in right hypochondriac region and epigastric region most of the time, gas, depression. Duration, three years. Result following operation, cured.

No. 24.—Age, 18 years. Previous operations, appendectomy. Result, no relief. Chief complaint, pain in right side since operation; frequent micturition; no urinary trouble; occasional reaction to sugar before operation. Duration, two years. Result following operation, greatly improved.

No. 25.—Age, 21 years. Previous operations, none. Chief complaint, epigastric pain, almost constant nausea, constipation. Duration, six to seven years. Result following operation, cured.

No. 26.—Age, 20 years. Previous operations, none. Chief complaint, nervousness, fatigue, foul breath, constipation, nausea, acid stomach and eructation after eating. Duration, ten years. Result following operation, cured.

No. 27.—Age, 22 years. Previous operations, none. Chief complaint, dizziness, fatigue, nervousness, nausea in the morning, cramping abdominal pains sometimes before and after meals. Duration, four years. Result following operation, cured.

No. 28.—Age, 25 years. Previous operations, none. Chief complaint, indigestion all her life, nervousness, fatigue, eructation sour food, burning in upper abdomen, transient sugar. Duration, many years. Result following operation, cured.

No. 29.—Age, 28 years. Previous operations, none. Chief complaint, anorexia, nausea after eating, no pain, drowsy feeling; not constipated. Duration, one year. Result following operation, cured.

No. 30.—Age, 22 years. Previous operations, none. Chief complaint, indigestion, loss of weight, cough; bowels regular. Duration, several years. Result following operation, cured.

No. 31.—Age, 41 years. Previous operations, tonsillectomy. Result, not given. Chief complaint, weakness, nervousness, nausea, frequent headaches, constipation. Duration, four years. Result following operation, greatly improved; complete recovery expected.

No. 32.—Age, 32 years. Previous operations, tonsillectomy, operation on ethmoid cells. Results, not given. Chief complaint, nervousness, weariness, fatigue, bodily pain, much gas, choking sensation when she eats, nausea. Duration, twenty months. Result following operation, improved. Environment and lack of means greatly delayed complete recovery.

No. 33.—Age, 50 years. Previous operations, none. Chief complaint, skipping heart, depression, marked fatigue, hyperacidity. Duration, five years. Result following operation, cured.

No. 34.—Age, 30 years. Previous operations, tonsillectomy, adenoids, hemorrhoidectomy, D. and C. Result, not given. Chief complaint, indigestion, nervousness, fatigue, pain over lower abdomen, nausea after eating, sour stomach. Duration, several years. Result following operation, cured.

No. 35.—Age, 39 years. Previous operations, appendectomy; right ovary removed; suspension. Results, no relief. Chief complaint, cannot sit up without abdominal pain; stomach full and much gas after eating, followed by nausea and acidity. Duration, post-operative. Result following operation, all symptoms relieved; doing well last report.

No. 36.—Age, 25 years. Previous operations, tonsillectomy. Result, not given. Chief complaint, constipation, toxic headaches, biliousness. Duration, several months. Result following operation, cured.

No. 37.—Age, 19 years. Previous operations, none. Chief complaint, dull pain in right side, constipation, much gas, frontal headaches. Duration, three years. Result following operation, cured.

No. 38.—Age, 44 years. Previous operations, none. Chief complaint, frequent bilious attacks, frequent eructation, pain in upper abdomen, constipation. Duration, several years. Result following operation, cured.

No. 39.—Age, 35 years. Previous operations, none. Chief complaint, soreness in epigastrium, gaseous distention, vertigo, dizziness, constipation. Duration, two years. Result following operation, cured.

No. 40.—Age, not given. Previous operations, none. Chief complaint, acidity, gas, choking sensation, constipation. Duration, several years. Result following operation, improved. Condition existed too long to correct mental aspects of case.

No. 41.—Age, 46 years. Previous operations, none. Chief complaint, pain in stomach, gas, constipation. Duration, many years. Result following operation, symptomatically relieved. No recent report.

No. 42.—Age, 25 years. Previous operations, tonsillectomy. Result, not given. Chief complaint, pain lower abdomen, constipation. Duration, two years. Result following operation, did well after operation; failed to report later.

No. 43.—Age, 52 years. Previous operations, none. Chief complaint, hyperacidity, eructation, myalgia. Duration, many years. Result following operation, symptoms relieved. Doing well one year after operation.

No. 44.—Age, 56 years. Previous operations, tonsillectomy. Result, not given. Chief complaint, indigestion. Duration, all his life. Result following operation, cured.

No. 45.—Age, 38 years. Previous operations, none. Chief complaint, epigastric pain, acidosis, chronic constipation. Duration, seven years. Result following operation, cured.

No. 46.—Age, 33 years. Previous operations, none. Chief complaint, acidity, gas, eructation, nervousness, fatigue. Duration, not given. Result following operation, cured.

No. 47.—Age, 38 years. Previous operations, none. Chief complaint, fatigue, depression, tachycardia, insomnia, constipation. Duration, several years. Result following operation, cured.

No. 48.—Age, 24 years. Previous operations, none. Chief complaint, gastric pain, gas, constipation, nervousness, fatigue. Duration, several years. Result following operation, cured.

No. 49.—Age, 22 years. Previous operations, appendectomy. Result, no relief. Chief complaint, indigestion, gas, fullness, diarrhea, constipation, pain. Duration, several years. Result following operation, symptomatically relieved; cure expected.

No. 50.—Age, 34 years. Previous operations, none. Chief complaint, pain in upper abdomen, distention, occasional nausea, frequent digestive upsets, nervousness, slight constipation. Duration, several months. Result following operation, cured.

[Author's Note.—All these cases have been under observation for a sufficient length of time following operation and treatment to have a fair idea of the result.]

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DISCUSSION

Dr. Willis F. Westmoreland, Atlanta, Ga.—This condition is purely a mechanical one, and it cannot be cured by medicine, rest, or diet. It is better to name these conditions right-sided abdominal conditions, as it is impossible to describe them under any one term.

The primary condition is always of embryological origin. It is developed in this way: as the colon grows downward by picking up the attachment of the parietal peritoneum, the lower condition is produced by some irregular growth in the ileocecal valve fold, which, instead of extending across the cecum, crosses down the fossa and pulls down the ileum. When these folds are separated the ileum is extended one-half or two inches. For instance, small tight bands will produce more of an effect than large or broad bands or several bands together. If the colon at its lower point becomes twisted, stasis is produced. I am satisfied in my own mind that embryologically the question is one of posture. The development of the gut has not kept pace with the erect position. When we walk on all fours the sigmoid or colon empties itself. Bands interfering with the colon will produce more or less intestinal stasis. In other words, the contents constitute a puddle, so that you get the toxic effect of the absorption there. These small bands will aggravate or produce more angulation of the gut than the broad bands.

The removal of what is known as Lane's kink, which is very broad, has no effect for the simple reason that a broad band will not angulate the gut.

I shall not go into the symptom-complex of these cases, because Dr. Strickler has covered that phase of the subject very well.

The first patient I operated upon was in 1906. I have always advocated a straight rectus incision, which gives me an opportunity for inspection which we do not get by the more popular McBurney incision. As soon as I recognized that the appendix did not produce the symptoms, it occurred to me that if the bands went on to angulation, it had something to do with the causation of the symptoms, and that it was necessary to correct the angulation. The removal of the appendix alone does not correct the condition. The appendix is an associated cause—never the primary cause. The appendix may aggravate the condition, but does not cause it. The removal of the appendix in 75 cases did not do any good at all. In quite a percentage of cases, where the operation of ligating the mesentery en masse was done, the distortion has increased and the patient was made worse by the operation for the removal of the appendix.

As to the effect of rest cure and diet, I shall simply mention one case. A patient had an attack when away from Atlanta and was treated by a stomach specialist, who made a diagnosis of visceroptosis. She was put to bed, the foot of the bed elevated, and the stomach strapped up. She was kept in bed for three weeks, during which time she gained twenty-odd pounds.

Dr. George M. Niles, Atlanta, Ga.—The subject of adhesions as well as the syndrome of symptoms, which Dr. Strickler so graphically portrayed, is one that is familiar to us all, and especially to those who endeavor to treat gastrointestinal disorders. The symptoms complained of include those of depression, "biliousness," a term which we use for lack of a better one, gas and distress. The symptom of gas is dinned into our ears so often that some of us hope some day to reach that happy state in those Elysian fields where we shall hear no more about the symptom of gas.

A little over a year ago, at a meeting of the American Roentgen Ray Society, Dr. Gregory Cole, of New York, read a paper on "Congenital Adhesions Around the Pylorus and in the Right Upper Quadrant of the Abdomen," which he called by the rather peculiar name of "cobwebs in the attic." He spoke of them as congenital and said that they can be diagnosed only by the intelligent use of the roentgen ray.

As to the effect of these adhesions, I judge Dr. Strickler and Dr. Westmoreland are on the right track. In congenital adhesions, where they cause lack of rotation, nothing can relieve the patient except well considered surgical treatment and care; but, gentlemen, operation for post-operative adhesions have not always in my observation given permanent relief. I have known of numbers of patients who were operated upon for post-operative adhesions by well qualified and careful surgeons; but only temporary relief was obtained, and the last state of these patients was worse than the first. Therefore, before entering into a surgical operation for post-operative adhesions, I think that point should be carefully considered.

Several years ago I was called upon to talk upon the subject of adhesions before the Surgeons' Club of Atlanta, and I made this illustration, which seemed to appeal to some of my hearers and friends, namely, a surgical operation for

post-operative adhesions might be likened to a cat fight, and you know that a cat fight generally means more cats.

Dr. Sydney R. Miller, Baltimore, Md.—I cannot refrain from entering an energetic protest against what seems to me to be a further and unwarranted inroad of surgery into the legitimate domain of internal medicine. Surgeons are notoriously not keen students of the personality factor of patients—and are far too prone to acquiesce in operating, too often a lamentable result of immature clinical study by the internist. Surgery today occupies a place of prominence, in contrast to medicine, which is both incongruous and productive of much harm.

If I understood Dr. Strickler's paper correctly, he speaks of a large and common group of cases upon which surgery should be the last thing perpetrated, not the first. These are patients too often tossed about from one specialist to another, nervous, malnourished, and complaining of a host of symptoms referable to the gastro-intestinal system, anorexia, constipation, vague discomforts, "biliousness," etc. They are egocentric sufferers, victims of that malign psychic state of over-awareness of themselves. Most of them have, among other things, certain fears of foods, or have been made worse by ill-founded dietetic fads, of either public or professional origin. Milk almost always makes them "bilious." X-rays will invariably show some degree of ptosis and evidences of probable adhesions. These people need most, patient hours of personality study, reassurance based upon meticulous observation, and must be taught how to meet certain of their annoying but trivial symptoms. Persuade them that the Lord was not in His dotage when He made foods to eat; encourage them to eat regardless of anorexia; persistently paint the alluring picture of health upon an ideal weight basis; and above all adhere to a systematic daily regime. As weight increases, digestion improves; the clouds of doubt and depression lift; and adhesions are broken by wedges of physiological fat.

Dr. W. R. Houston, Augusta, Ga.—The group of cases to which Dr. Strickler referred, cases of extreme asthenia with predominating gastro-intestinal symptoms, are among the most perplexing that the internist is called upon to study. I have recently had occasion to review the literature upon the subject. An article by Dr. Bryant in the *Annals of Surgery* for 1912 reports a number of these cases under the name of "Membranous Pericolitis." He seems to think with the author that relief may be secured merely by the breaking up of adhesions. A year ago in the *British Medical Journal* appeared the monumental contribution of Waude in which nearly two hundred cases were reported with the results of operation. His paper is entitled "Mobile Ascending Colon." A large percentage of his cases had gone through an antecedent appendectomy without relief. By means of his operation which consists in a thorough-going fixation of the acending colon to the posterior abdominal wall he reports brilliant successes. He emphasizes particularly the extreme fatigueability of the patient as the major symptom, other symptoms such as gas and discomfort after eating being merely expressions of a general fatigueability. These cases come up so often for consideration and the internist is so hard put to it by the persistence of them in certain instances that he is naturally disposed to accept the surgeon's suggestion that they be operated upon. In nearly every community of any size there is to be found a surgeon who is sanguine as to the results of operative treatment in these cases. Yet the advisability of operative treatment has never been largely attended to and in the ten years that have elapsed since it was first prominently brought forward the general consensus has been adversative. As Dr. Strickler has said, "Subsequent to the operation it sometimes requires two years of medical care to restore these patients to normal." There must be very few cases in which two years of intensive medical re-education and discipline may not accomplish these results, and it is not improbable that the lack of energy on the part of the physician and the lack of perseverance in the patient is the cause of our having them go to the surgeon for treatment which after all may possibly be in itself largely suggestion.

Dr. Henry S. Ward, Birmingham, Ala.—This, gentlemen, to me is the old story. Apparently every year or two some one comes forward with a marvelous method of treatment. I think a large number of these cases belong to those in which Lane removed the colon. The same syndrome the essayist described in his paper is also described by Lane, and with the removal of the colon it would seem they all got well. I have been in the habit of taking out the tonsils in some of these cases. I think it is the same old class of people handled in a new way. Some of these patients are so down in the depths, whose will power is so weak, that they have not the ability to adjust themselves to the ordinary way of living. Frequently, I think a surgical operation is a sort of mental or psychic shock, and with the aid of the medical man after operation the patient is put on the road to recovery. Every now and then we all get hold of these cases. They have had surgical shocks, but not the mental building up by some good internist. If the surgeon will give the medical man his proper rights after he gets through with these patients, we shall have much better results than we have had in the past. It is a good thing for the surgeon and internist to get together and treat this type of case. The surgeon can do whatever surgical work needs to be done, but after that they should be sent to medical men to be taken care of.

Any form of treatment properly boosted often relieves. Otherwise, no matter what the treatment, we fail. Many again, both by heredity and environment, seem not to possess sufficient moral fiber to meet the strain of life and shield themselves from invalidism. So far, there is no royal cure.

Dr. Tom A. Williams, Washington, D. C.—I had no intention of taking part in this discussion until I heard two of the internists present attack the paper and the first discusser of the paper.

We are talking of different things altogether. Dr. Miller spoke about a disease which we all know very well, especially we neurologists, and I am very glad that internists are beginning to find gastric neuroses (as we used to call them) which are cured by persuasion, suggestion and re-education, as he explained; but I do credit the author of the paper with a degree of common sense greater than not to be able to differentiate that syndrome when he sees it. The paper is a real contribution to a study of a difficult subject, namely, the abdominal neurasthenic, to use a loose term. He specifically stated that a patient in whom there were large bands was not improved if these bands were divided, and he would exclude any effect of suggestion by the operation from his general view of his cases. The patients who were improved were those who had small bands, small adhesions, which were formerly overlooked. So it would seem to me we should not simply laugh away this paper. I take it that there is no quarrel between the physician and surgeon in regard to this class of cases. If there is, the surgeon and internist ought to stop fighting. Dr. Strickler has given us a definite contribution of a specific case which is not psychic at all, who has not his stomach in his head, who is not a phobiac, in the first place, but is a phobiac only for the distress he feels in the abdomen, and misinterprets that as possibly a swelling which will stop the heart from beating. The patient is weak because he has intestinal stasis and constipation and is intoxicated, and not because he thinks he is weak. He is not in reality a psychic case at all, but a patient suffering from a lesion such as the essayist has pointed out, and if the essayist knows how to differentiate that case from the cases which have a phobia and are purely functional and can be cured, he has given us a valuable contribution which I for one certainly welcome.

Dr. Strickler (*closing*).—The paper received about the reception I expected. In as much as these cases have been under observation for fourteen years, the conclusions presented are not the result of any snap judgment on our part.

Many of these patients had been treated for years before we were consulted, several having been to some of the best clinics in this Country, and yet had obtained no permanent relief. However, when we had them operated upon, the underlying pathology relieved, and the proper after-attention given, the results have been most gratifying. "The proof of the pudding is the eating thereof." Before this plan of treatment, many of these cases were an economic loss. After this plan of treatment they are able to take up the duties of life and perform them in a satisfactory manner.

We do not, by any means, operate upon all these cases. By proper rest, diet and exercise many of them can be put in a reasonably good state of health and remain comfortable as long as they follow directions. Others, no matter what plan of treatment is adopted other than the one under discussion, never remain well until the mechanical condition is corrected. For the information of one of the speakers who referred to the removal of tonsils, I may say that many of these patients have had this operation without any benefit whatsoever.

In regard to the length of time required for recovery, in cases of short duration, before fixed ideas have become established, this is reasonably prompt. However, when persons have suffered for years, a number of weeks and sometimes months are required in order to re-educate these patients and prove to them that it is perfectly possible to do many things which they consider deleterious or impossible.

I am quite satisfied that many of the bad results following operations of this character have been due to the fact that the cases were dismissed too early and did not receive the after-care which they demand. The operation is only the first step toward the cure. All these patients should, following the operation, be placed under the care of a competent internist until they are fully restored to health. In certain instances a rest cure is indicated, followed by a change of scene and environment and an abundance of outdoor exercise. In addition, they must be taught the right attitude toward life, its duties and responsibilities. We have found by actual experience that this plan of treatment will secure the desired results and, therefore, feel sure of the correctness of our position.

ILEOCECAL DELAY AND VAGUS REFLEX AS ETIOLOGIC FACTORS IN BRONCHIAL ASTHMA*

By J. T. Wolfe, M.D.,
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It is not my intention to dwell on the many features of bronchial asthma so well known to the profession, but to confine my attention briefly to the etiology and treatment.

Asthma is not a disease entity, but is a symptom, and the underlying cause must be found and removed or corrected in order to effect a permanent relief.

Many theories—over five hundred since the time of Hippocrates—have been advanced to establish the etiology of asthma, a few of which I shall review briefly.

Heredity has been advanced as a factor in the causation, but heredity plays a part only as several members of a family may have a defect which leads to the symptoms, and I have seen several instances where

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there were two or more cases in one immediate family.

Atmospheric conditions exercise an influence only as an irritant might to excite the irritability or hypersensitiveness of the mucosa and the nerve terminals in the bronchioles, or they may serve to bring about a catarrhal state, which in turn will increase the irritability of the bronchioles.

Pregnancy can be considered in a very minor degree, as the affliction exists in both sexes and pregnancy can cause only an increased burden upon the mother's circulatory and respiratory systems, while bringing about increased metabolic processes, with the resulting formation of increased amount of toxins.

An inflammatory condition of the eyes, ears and upper respiratory passages may extend downward into the trachea and bronchial tubes with a resulting bronchitis. Also a vasomotor disturbance in the mucosa of these regions with resulting inflammation and engorgement makes a favorable site for the lodgment of infection which may set up suppuration in the adjacent sinuses, which condition in turn causes production of more toxins and their absorption into the general system.

It has been pointed out that eczema, urticaria and psoriasis may be produced by some agent which gives rise to paroxysms of asthma. Von Noorden has called attention to the fact that individuals who in their youth suffered with stubborn attacks of these skin diseases later in life developed asthma.

Allen Eustis in the *New York Medical Journal*, May 27, 1916, says:

"Most cases are caused by absorption of proteolytic toxins, which may be absorbed from a suppurating sinus in the nose or from the intestinal canal. Treatment of intestinal toxemia is as important as drainage of focal infections."

In another paper he says:

"The writer has found evidence of autointoxication in every case of asthma examined by him for four years, leading him to believe that during the attack there is some toxic agent in the blood which acts similarly to muscarine to depress the respiratory center to such an extent that the reflex stimulation of an inflamed nasal mucosa results in a stimulation of constrictor fibers of the vagus. Nearly every one of these cases was relieved by diminished nitrogenous diet and measures to reduce toxemia."

Diphtheroid organisms have been found in sputum closely resembling morphologically those belonging to staphylococcic, streptococcic and pneumococcic groups.

Chelmonski, in 1912, described thirteen cases in which x-ray revealed the presence of swollen lymph nodes encircling the bronchi, the largest nodes in the worst cases of asthma.

Alteration of internal secretions has been suggested as the cause of toxemia resulting in asthma by producing excitability of the respiratory centers.

Anaphylaxis, or sensitization to a specific protein, was advanced by Meltzer in the September *Journal of the American Medical Association*, of 1910. While it is true that many sufferers are sensitized to certain substances, it is quite possible that this sensitivity is the result of toxins causing an irritability of the local nerve terminals, rendering them subject to irritation by certain specific proteins, and if the source of the toxins should be removed the excessive irritability would cease. Also this irritability may be due to a reflex action and if the cause of the reflex can be located and removed the effects of the protein sensitization will disappear.

I. Chanoler Walker, at the Peter Bent Brigham Hospital, Boston, has been doing considerable work on this sensitization theory in a series of six hundred cases of asthma. His working theory is based upon protein sensitivity with a sub-classification of animal emanations 16 per cent, including dandruff, horsehair, feathers, cattle hair, wool, dog hair, etc., 12 per cent to different types of food proteins; 10 per cent to bacterial proteins; 11 per cent to pollen proteins. The remaining he classified as seasonal non-sensitive and occupational. Under treatment he mentions potassium iodid, codein and adrenalin, but relies upon protein desensitization specially by feeding the protein after determining the protein by skin reaction. He decries promiscuous operations in the nose and throat for relief of this condition and says that the conscientious nose and throat specialists have learned to refrain from removing everything in their operative field as a cure for asthmatic conditions. He cites a case reported by Dr. Babcock where an asthmatic patient who had gallstones was relieved after successful operation and drainage of the gall-bladder. He

also cites a patient of his who developed a hernia and soon was troubled with asthma, but was relieved by herniotomy. The same patient developed hernia on the opposite side and again was troubled with asthma, only to be relieved upon the second successful herniotomy. He admits that climatic change is an expensive experiment and usually a poor investment.

Some authors pointed out alternating attacks of urticaria and asthma. It will be recalled that urticaria is a cutaneous manifestation of a toxemia, generally considered intestinal.

Numbers of cases of asthma have associated hay fever, but this condition is by no means present in a majority of cases of asthma. However, there is no reason why a hay fever patient may not have the underlying pathologic conditions to bring about asthma.

Morbid changes occur in the bronchial mucosa in a large percentage of cases and some observers have attributed the paroxysms to this catarrhal inflammatory swelling, but the sudden onset and disappearance preclude this theory. The writer feels that these changes may be due to disturbance of the trophic and secretory influence of the vagus nerve.

Dyspeptic asthma is a term applied to those cases where the attacks come on during the process of digestion, especially if any exertion be made at that time. This type has been cited by Dr. Max Einhorn, in the *Journal of the American Medical Association,* February, 1902, and divided into two types: those that come on immediately after eating and those that come on two or three hours after.

Dr. David I. Macht, of Baltimore, writing in the SOUTHERN MEDICAL JOURNAL in July, 1919, on the use of benzyl benzoate, says:

"Even these cases of so-called 'true asthma' are not an entity and the etiology and pathogenesis of asthma are still in a state of hopeless confusion."

Again in the same article,

"Indeed, in view of our lack of knowledge of the etiology and pathogenesis of asthma it is not at all surprising that many cases of asthma are not helped by this benzyl benzoate, as the drug acts merely as a broncho-dilator and sedative to the bronchial muscle."

He claimed 75 per cent of cases were benefited and that in some the action was very striking; in fact, only equaled by the action of adrenal chlorid subcutaneously. He claims no cures; and the best that can be made of his article is that benzyl benzoate is only a palliative to allay the spasm. Personally, I have had some alarming reactions from the administration of adrenalin and now use it only in selected cases.

E. L. Smith, in the *Medical Record,* January 29, 1907, says:

"Asthma is caused by a reflex irritation of the pneumogastric nerve which causes the muscular fibers of the bronchioles to contract. The cause of this irritation is swelling of the nasal mucosa and pressure on asthmatogenous areas. The circular muscular fibers of the small bronchioles are well developed and are controlled by the pneumogastric nerve."

Dr. Pottenger agreed with me that asthma is due to a sustained reflex condition of the vagus nerve, a state of hypertonus, and that any pathologic condition which could keep the vagus in a chronic state of irritation could cause the reflex contraction of the circular muscles in the bronchioles, admitting as factors the nose, nasal sinuses, tonsils, throat, genito-urinary organs, etc.

This brings me to the germ of my paper: that my findings during a period of ten years' study of this condition have taught me that cases of asthmatics show marked abdominal disturbances. Some cases had severe attacks of vomiting with the asthma, even to the vomiting of bile. Some had marked abdominal soreness, especially after several days' duration of the asthma. These and other phenomena led me to a close study of the abdomen in all my cases and I found practically without exception that they had more or less tenderness, especially over the entire right rectus with more or less rigidity of that muscle; that they were mostly constipated, though once in a while an individual would tend toward diarrhea; that practically all had marked enteric gas.

I had a case of a man 64 years old, an asthmatic for 20 years, who had such marked abdominal discomfort that I recommended operation, which I performed at George Washington Hospital four and one-half years ago. I found the appendix cecum and the entire ascending colon bound down with adhesions. Upon removing the appendix and freeing the cecum and ascending colon the patient made an uneventful recovery, was relieved of his asthma and has never suffered a recurrence.

About two months after his operation, his daughter, also an asthmatic, who was being troubled with enteric gas to the point of distention and who had been having severe pain in the small of the back for a period of nearly two years, consented to operation. She had had an operation and drainage for an appendiceal abscess 18 years previously and been told that the appendix had sloughed out. Believing she had a condition requiring operation she consented, and I operated upon her at George Washington Hospital and found a short stump of an appendix about three-quarters of an inch long, retroperitoneal in type. Her cecum and ascending colon were entirely bound down with adhesions and the omentum was adherent to the colon. Complete relief followed her operation, to say nothing of disappearance of pain in the back and general improvement in health.

These two cases served to convince me that this condition of adhesions of the cecum, appendix, ascending colon and in some instances the lower part of the ileum had a marked bearing on asthma from the standpoint of etiology.

My work since then has still further convinced me. For a long time I was divided between two theories: one that the delay at the cecum caused the contents to remain in the small bowel too long with resulting putrefaction and fermentation with reabsorption of toxins through the small bowel, and that these toxins circulating through the body produced irritability of the muscular fibers in the bronchioles; and the other was that irritation of the lower terminals of the pneumogastric due to these adhesions caused a reflex or chronic state of irritation in the upper terminals supplying the bronchioles, thus producing the spasm under discussion. I am rather inclined to feel that both factors enter into the symptom complex.

To freshen our memory: the pneumogastric takes origin from the floor of the fourth ventricle, leaves the cranium by the jugular foramen, runs down the neck and has branches connecting with the fifth, seventh, eleventh and twelfth nerves, supplies branches to the pharynx, muscles of deglutition, muscles of the larynx except the crico-thyroid, esophagus, heart, bronchial tubes, stomach, liver, kidneys, omentum, spleen and small and large intestines, with motion, sensation and secretion. A branch is given off from the ganglion of the root to join the petrous ganglion of the ninth nerve. The pneumogastric does not supply the tonsils, but the ninth does, also the soft palate and fauces.

I can find no authority for believing that the vagus supplies the tonsils or the genito-urinary system, so I cannot agree that a hypertonus state of the pneumogastric can be brought about through reflex from irritation in the genito-urinary tract, tonsils, nasal passages and sinuses.

In order to appreciate how any factor precipitates an attack of asthma, we must understand something of the mechanism of asthma, and I believe the most logical theory is that the small circular muscles of the bronchioles contract and constrict their lumen, thereby preventing the free passage of air through these bronchioles. Asthma is something of a convulsion of these circular muscles, and in order to obtain such a convulsive contracture, we must get a motor impulse to these muscles. It will be recalled that the vagus has motor, secretory and sensory functions, together with trophic, so it can be readily seen that a stimulus of the vagus nerve can excite any one or all of these functions. Recalling the great distribution of these nerves, it will readily be seen that any chronic irritation of them can serve to keep them in a chronic state of sensitivity or hypertonus, or exaggerated reflex, call it what you may. Just a moment's thought will recall that there are practically no usual causes along the path of the left vagus, but that the right has the gall-bladder, bile ducts, ileocecal junction, which is a site of heavy traffic, and the appendix. It can then readily be understood that the right vagus is the one which starts most of the trouble.

Disease of the gall-bladder and bile ducts; chronic inflammation of the appendix with attending irritation of the ileocecal junction and lower portion of the ascending colon, with resulting chronic peritonitis of these parts and formation of varicose veins and adhesions can readily serve to keep the right vagus in a state of hypersensitiveness so that almost any stimulus can cause the discharge of the impulses to bring about the constriction of the small circular bronchiole muscles. It can be seen readily that a heavy meal, with overburdened digestion; errors of diet (call it sensitization if you will); overexertion; excitement; indigestion with gas

formation; inspiration of dust or pollen or any local irritant to the mucosa covering the small bronchiole muscles; or an attack of acute bronchial cold or infection can precipitate the impulses in the constrictor fibers of the vagus to bring about the phenomenon which we term asthma.

We must not forget the secretory function of the vagus. Many of us have seen our patients suddenly fill up with mucus without warning and a wild, frightened expression seize them. On the other hand, the motor function may predominate for days and we will see dry asthma with no secretion, relief coming only when the cough develops and the patient can begin to raise mucus and expectorate. Lack of time and space forbid me from enlarging upon the clinical picture which many of us have often seen, than which there is none more pitiful.

From the above we can draw a simple illustration, "That a gun cannot be fired unless it is loaded." Remove the load from the gun and you can pull the trigger at will and no discharge will take place. So it is with the vagus. The convulsion cannot be precipitated through its terminals if the nerve is not subject to some exciting influence, and in a state of hypertonus or exaggerated reflex ready to respond to one or any or all of the above named exciting factors. Then the logical thing to do is to remove the cause that is keeping the vagus loaded and ready to be discharged by finding that chronic exciting factor and removing it.

Looking back over my cases prior to the discovery of the abdominal condition, I can readily understand why some of them had such prominent digestive disturbances. I shall report a few of them.

C. C., a male, age about 36, lived an outdoor life in the mountains and had chronic asthma with severe paroxysms of very intense nature. He was well developed physically, but sensitized to banana protein, as a slice one-fourth of an inch thick would precipitate an attack. He was operated upon for an abdominal condition about June 1, 1919, and has had very little trouble since. He states that he can eat half a dozen bananas without precipitating an attack.

J. A., a female, extremely emaciated, was 5 feet 9 inches tall and weighed 93 pounds. She had had asthma for 20 years constantly and chronic pleurisy on the right side with pain and constant cough. She was sensitized to egg and had chronic albuminuria. She was operated upon September 15, 1920, and extensive adhesions, etc., were found. She is gaining in weight, the pleurisy is about gone, and she sleeps all night. She coughs very little and is gradually improving. She eats eggs *ad lib.* and the urine is clear of albumin.

J. A., a male, 11 years old, had had chronic asthma for 8 years. He weighed 50 pounds. He was operated upon August 21, 1920, and extensive adhesions and enlarged glands up the ascending colon were found. He gained 10 pounds the first week after leaving the hospital, above the pre-operative weight. His body is building up and gradually getting free from asthma.

G. R., a male, aged 36, was operated upon September 27, 1920. He had been always troubled with a cough and more or less pleurisy on the right side. He was very thin and run down. He had had digestive disturbances and chronic albuminuria. Since operation the cough is gone and what sibili he had have disappeared. He is gaining weight and doing finely. He has no albuminuria at the present time.

A. B. R. was a river man, aged 49, and only fairly nourished. He had had chronic asthma 10 years and could work only part of the time. He was operated upon August 31, 1920. He had a chronic adherent atrophied retrocecal appendix and massive adhesions of the cecum, ascending colon and hepatic flexure. He has had a few mild attacks since operation, but says he could lie down in them. He is practically free now of asthma and the stethoscope shows no sibili.

W. C. C. was a male, aged 34, who had had severe attacks of asthma for about 9 years. Four physicians in his family brought a prominent surgeon into the case, who insisted on the gridiron incision. I could remove appendix, but could not free adhesions. The case was improved, but not a success.

I could site more, as I have had a series of seventy-five cases of asthmatics of varying stages, 33 1-3 per cent of whom have been operated upon with such satisfactory results that I feel justified in continuing the work upon those who do not respond satisfactorily to medical treatment. Medical treatment consists largely in correcting, as far as possible, the errors of digestion and the use of such expectorants and vaccines as will correct the secondary bronchitis.

A review of my cases convinces me that a number of the so-called "protein-sensitive" patients were sensitized only inasmuch as they had derangements within the abdomen, and also that many of the cases I treated before beginning to operate were suffering with the same condition.

The length of time for complete recovery following operation to release the cecum, colon and omentum from adhesions,

varies. I usually tell my patients that they must not expect complete relief from asthma under a year, that it takes a certain length of time to repair the diseased condition of the bronchial tubes and to outgrow the habit of spasm in the muscles of the bronchioles. Those cases that continue the attacks following release of adhesions gradually improve in that the attacks get lighter and further apart, though I have had a number of cases that never had a recurrence following the operation. Several of these patients had had their tonsils removed, septums straightened, etc., to say nothing of climatic changes and such treatment as they could get. I am fully convinced that there is some basic fundamental pathologic condition behind this protein sensitization theory such as I have described, and treating the sensitivity is treating the symptom and not the disease.

The operation consists of opening the abdomen by means of an overlapping right rectus incision parallel to the median line one inch from the outer margin of the rectus. The skin is divided, then the sheath of the rectus immediately beneath the skin incision. The rectus is freed from the outer portion of its sheath and retracted toward the median line. The peritoneum being thus exposed directly beneath the skin incision is opened and the ascending colon located and traced to the appendix. Appendix, cecum and ascending colon are usually bound by adhesions, but some cases show only a chronic dirty appendix that is not adherent, while the adhesions may begin at the upper portion of the cecum. The omentum has usually become bound to the colon by web-like adhesions and the collateral circulation between the omentum and colon is well established, large tortuous veins of a varicose type being present. In some cases the bowel is so bound that it is completely enveloped by adhesions. The omentum is freed from the colon up to the hepatic flexure and the bleeding points are all tied off with plain gut, step by step. The colon, which has been bound down, upon being released immediately balloons considerably, as it has not been in the habit of employing its circular muscle fibers. After removing the appendix and freeing the adhesions the incision is closed.

For ten years I have been employing slow distending enemas daily to distend the colon, following abdominal operations, to prevent the colon from being bound again by adhesions. Under this method no case has given trouble with adhesions following operation. Also I refrain from feeding the patient till the third or fourth day, as introduction of food seems to serve only to promote the formation of gas and distress for the patient, as the digestive function is practically paralyzed following laparotomy for any cause.

The follow-up of these cases, after convalescence from operation, where there has been marked change in bronchial tubes and lungs and pleura is important, as the old, long-standing bronchitis has to be cleared up to obtain perfect relief.

It will be seen, if my hypothesis is well taken, that asthma can be relieved by locating and removing the cause of the hypertonic state of the vagus nerve. I do not claim that adhesions such as I have described and the resulting chronic peritonitis are the only cause of this hypertonus, for I feel there are other conditions along the path of this nerve that might arise, but I do believe that a majority of such pathologic factors will be found within the peritoneal cavity and that the adhesions above described will constitute a large majority of these intra-peritoneal conditions. Also the production of intestinal toxemia must always be considered as a factor in keeping the patient's health below par.

DISCUSSION

Dr. W. W. Duke, Kansas City, Mo.—Real asthma, excluding cardio-renal asthma, emphysema, enlarged thymus, etc., is due to a congenital state which permits an individual to become sensitive to some foreign substance. Once sensitive the individual is likely to have asthma whenever he comes in contact with the substance to which he is sensitive.

I can readily conceive that abnormality in the intestinal tract or its appendages might predispose to the absorption of partly digested substances which could sensitize a susceptible individual, and that thereafter the absorption of such products could produce asthma. I can also readily conceive that correction of defects of this sort might change the nature of digestion or putrefaction and in this way eliminate the elaboration of the substance which was damaging to the patient.

Some years ago I reported a number of cases of abdominal pain due to hypersensitiveness to foods, such as honey, shad roe, egg, etc., and in these patients found a serious lesion in the abdomen in over half of the cases. In several of these partial relief of the hypersensitive state was obtained by surgical correction of the lesion found. For example, one patient invariably had severe abdominal pain following the ingestion of milk or lactalbumin. The same pain could be reproduced by subcutaneous injection of lactalbumin. The patient was found to have gall-stones; and following the removal of gall-stones could drink a certain amount of milk without discomfort.

Reflexes through the vagus unquestionably add to the symptoms caused by hypersensitiveness to foreign substances. It is well known that asthma due to pollen sensitiveness, for instance, may be either made worse or relieved by such reflexes as those caused by evacuation of the bowels by emetics or vomiting, by the ingestion of food, by the inhalation of cold air, etc. Such reflex factors, however, I believe are purely secondary. While they are important, they sink into insignificance in comparison with the primary source of asthma, namely, hypersensitiveness to foreign matter.

Dr. Sydney R. Miller, Baltimore, Md.—Dr. Wolfe is right in saying that in all likelihood asthma is a symptom rather than an entity. That its causes may be multiple no one can doubt.

Despite the advancement of some four or five hundred theories about asthma, we had no concrete knowledge about its mechanism until Meltzer's work came out some eight or ten years ago. In the study of anaphylaxis he observed that certain phenomena were analogous to the condition clinically known as asthma. Work was started along that line which has developed very successfully since, and the burden of proof is now upon those who do not subscribe to the allergic theory of this condition. It has been shown beyond much question of doubt that in most instances the state of hypersensitiveness is a factor inherited in accordance with certain laws laid down by Mendel.

I cannot possibly agree with the point of view which Dr. Wolfe advances: that asthma results from the effect of adhesions somewhere around the cecum, demanding primarily surgical intervention. It would require a great deal of stretching of my imagination to believe that such a condition as this would explain attacks of asthma which follow within a few minutes after exposure to, ingestion of, or contact with specific proteins. It could hardly explain the asthma which develops in the early years of childhood, following the first ingestion, for instance, of egg white. It is rather difficult to believe that a patient who suffers from asthma only at one season of the year when exposed, for instance, to ragweed pollen or when brought in contact with animal emanations, has this reaction as a result of some intestinal toxemia; nor is it easy to believe in the wisdom of advising an operation for such a patient with the expectation that adhesions loosened will prevent subsequent attacks of pollen or animal asthma. Whatever we may think about asthma, we may as well be honest and admit that we know relatively little about it. It is our experience in Baltimore that many showing a specific protein factor can be cured either by desensitization or by persistent avoidance of the article which induces the attacks. Many cases seem to improve after the utilization of justified surgery, such as the removal of bad teeth, tonsils, or the clearing out of infected sinuses. But the vast majority of such cases tend sooner or later to manifest again their asthmatic symptoms. I should be loath to have many patients operated upon under the inducement that an abdominal operation would have any particular benefit.

Dr. A. L. Levin, New Orleans, La.—Widal, after experimenting for a number of years, demonstrated that if a protein which is not chemically well disintegrated enters the portal circulation and the liver does not arrest it, there is a crisis expressed by a leucopenia, a fall in blood pressure and a change in the coagulation time. I took up this matter and those observations I shall explain in detail when I read my paper tomorrow morning. I have studied a number of cases representing various groups, among which is a group of asthmatics.

A case of asthma during an attack was referred from the medical clinic to our service with gastric symptoms. He gave a decided leucopenia after protein ingestion. Widal has demonstrated in cases of that type and of other types that there is a disturbed liver function. We can immunize them in from twenty minutes to half an hour before the protein meal is given by small quantities of panopepton in one-half or one-ounce doses. In cases of asthma it was interesting to observe that after a disturbed proteopexic function of the liver was corrected they improved. Evidently Widal is right.

Other observers claim that we find albumoses and peptons crossing the gastric and intestinal mucosa before they are changed to the stage of amino-acid; and that if we improve the chemical breaking up of the substances before they go into the portal circulation we may relieve the liver of great embarrassment. In my experience, as a rule, we find in asthma cases a low hydrochloric acid content. They often have biliary disturbances when they take protein; the protein is absorbed from the mucous membrane into the portal circulation before it is chemically prepared for it, and disturbances result. I have put these patients on hydrochloric acid after meals and pepton half an hour before meals, and in less than thirty-six hours the attacks of phenomena have disappeared.

Dr. E. C. Thrash, Atlanta, Ga.—Asthma is a symptom-complex arising from multitudinous causes, many of which we know nothing about. It arises frequently from hypersensitiveness to flora of the respiratory system. The proteins of these flora are undoubtedly the cause of more of the asthmas than all other causes of which we know.

The next most common causes of which we know are those resulting from faulty metabolism. This metabolic disturbance arises chiefly from disease processes which set free toxins into the circulatory system, such as the various kidney dis-

turbances, cardio-renal complexes and endogenous intoxications.

It is beginning to dawn upon us now that the disturbances of the internal secretions have something to do with asthmas, but we have made little progress in obtaining definite knowledge of their exact relations.

As one of the feeble sources of asthma, I would think of intestinal disturbances of all kinds.

It has been shown conclusively that bacteria, food, pollen and other protein sensitization are the most common causes of asthma, and we have accomplished much in the way of relieving these disturbances with desensitization by inoculation of the proteins.

I have obtained poor results from food protein desensitization, but have succeeded in desensitizing with pollen proteins and the bacterial content normally found in the respiratory tract.

Dr. Allan Eustis, New Orleans, La.—When we speak of serum sickness we say nothing but that there is a toxemia. There is a proteolytic toxin or toxins liberated in the circulation in this condition and it is possible that analogous proteolytic toxins can be absorbed from the intestinal canal.

A large number of hay-fever cases in which there is no definite anaphylaxis or protein sensitization may be greatly relieved by overcoming the intestinal toxemia. They will often go through a whole season if watched carefully for absorption of intestinal toxins without an attack.

My experience in intestinal toxemia does not coincide with the views that have been expressed by Dr. Wolfe. In a series of 350 cases there were only 2 in which I found it necessary to resort to surgery to overcome the intestinal toxemia. Most cases of intestinal toxemia can be overcome by dietetic and hygienic measures without resorting to surgery.

Dr. Wolfe (closing).—In the discussion no one spoke of the mechanism of asthma. There must be contraction of the bronchial muscles, and for that there must be a direct stimulus of the muscles or a nerve impulse. You can bring this about by local irritation or by absorption of proteolytic toxins after hypodermic inoculation. We know that a certain substance circulating through the system will either excite nervous impulse of a muscle or locally irritate the muscle when it gets to it. I do not know which it does.

Protein sensitivity excites something that brings about this mechanism, whether it does it in the circulation by direct contact or by irritating the vagus nerve, thereby contracting the fine bronchioles.

Sanborn in a series of 800 cases observed at the Mayo Clinic reports 500 that were absolutely negative to protein sensitization. One hundred doubtful, while 200 cases were positive.

Has any one ever done a series of 800 protein inoculations on normal individuals? We should probably get 25 per cent reactions by any skin inoculation, even some by salt solution.

Of course, we all dislike to see patients operated upon. I said in my paper two years ago that I operated upon one-third of my cases. Since then my ratio has markedly decreased.

Deep abdominal massage is one of the most valuable factors in the treatment of these cases. Outdoor exercise has been emphasized, but I find deep massage over the entire abdomen and especially over the ileocecal junction, toning up the intestinal muscles so that the patient eructates gas, very valuable treatment. Some patients begin to eructate as soon as I commence massage. It tones up the abdominal muscles which have become so relaxed that they have ceased to perform their function properly. In the operation, the bowel is frequently found bound down so that in releasing the adhesions it balloons out, which shows that its circular fibers have been practically paralyzed owing to long disuse.

In regard to the time of recovery following operation, it takes a certain amount of time to repair the human body after the removal of a chronic infection or anything else. In some cases we may have a purely functional disturbance to deal with.

Dr. Levin spoke of the fact that proteins may enter the portal circulation in a raw or semi-digested state, and stimulate the bronchiole muscles to contract, thereby producing asthma. After my operation and restoration of the digestive function the patients split up the proteins and they no longer enter the portal circulation in a raw state. If they are injected under the skin they can still irritate the bronchial muscles, as they enter raw.

The digestion has been markedly improved in all these cases, and every one is living. The second case I reported, the daughter of the first case, gained from 95 to 160 pounds, showing the general improvement in her condition. You improve these cases if you improve their digestions.

Dr. Thrash said that asthma is a symptom-complex, with multitudinous causes. That has been brought out in many instances, but all these causes simply precipitate the mechanism of asthma. I operated upon a man who was sensitized to milk chocolate. I found slight adhesions, a definite Lane's kink and a true angulation of the ileum as it entered the cecum. Within a month after operation he carried a bag of chocolates in his pocket and ate them on the street. His digestion was completely restored.

MALARIA IN CHILDREN AND THE ABUSE OF QUININ*

By Eugene Rosamond, A.B., M.D.,
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It is the custom of physicians in the Mississippi Delta, especially in the smaller towns and in the rural districts, to give quinin to all patients they see during the malarial season. This practice finds justification in the argument that waiting for a laboratory report from a distant city, or even waiting to carry a blood slide back to their own offices, finding the time to examine it, and then getting the report, the medicine and the instructions back to the patient who, perhaps, lives miles away, would needlessly sacrifice many lives.

Again, it is practically impossible for most country practitioners, busy perhaps sixteen hours in each twenty-four, to examine promptly the large number of blood slides they might collect in a day's work, even if they possessed the requisite skill with stains and microscope.

The establishment of district laboratories by the various state boards of health, the building of good roads and the automobile are rapidly bringing the necessary laboratory aids to the country doctor. But the problem of time still remains, and so for a while longer we can find no criticism of the promiscuous giving of quinin, provided it is given by mouth and in physiological doses, and must endorse it on its record of lives saved.

But to us as specialists, living in the larger towns and equipped to make differential diagnoses, there can be no justification for the "therapeutic diagnosis" of a disease whose presence or absence the laboratory can determine with certainty.

Despite various text book statements to the contrary, the opinion prevails among a majority of our better informed physicians that the percentage of positive laboratory findings is low as compared with the actual number of malarial infections. To determine the accuracy of these opinions, I examined the records of 300 cases of malaria treated at the General Hospital of the City of Memphis with the following results:

No. of cases	300
No. of cases in which parasites were found	291
No. of cases in which parasites were not found	9
Percentage of positive findings	97
No. of aestivo-autumnal infections	150
No. of tertian infections	141
Spleen palpable in	142 cases
Spleen not palpable in	158 cases

In the nine cases where the parasites were not found, all had had quinin previous to the blood examination.

These examinations were made under the supervision of Dr. William Krauss, Director of the Laboratory for Field Investigation of Malaria, U.S.P.H.S., who, by courtesy, is doing this work for the University of Tennessee, for Memphis physicians, and for west Tennessee.

Of course, we must take into consideration that the hospital case is a case of heavy infection, but even so, this result shows that the blood test for malaria is more reliable than is the Wassermann test for syphilis, and we do not give arsphenamin on a negative laboratory report.

In our children's clinic, which handles over 1500 private patients monthly, many of them coming from various sections of the Delta, all cases of proven malaria (and no child is given quinin unless the parasite is found) have been carefully tabulated as to mode of onset, symptoms, duration of fever, dosage of quinin, number of relapses, etc., and in a series of 100 cases studied, ranging from 17 days to 15 years, we have reached the conclusion that malaria in childhood presents no special problem either in symptoms, clinical course or in response to treatment. Malaria is malaria. The incidence of age has nothing to do with it except that the protective organism of the child is inferior to that of the adult and responds more violently to toxines, so that convulsions in children often replace the chill of the adult, just as is the case in any acute infection.

Malaria may of course simulate almost any disease, but so may typhoid fever, and unless its course has been modified by the administration of quinin it usually runs as true to form as any infection we see.

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Because of the inferior protective organism of the child, phagocytosis by the endothelial cells of the capillaries and by the large mononuclear cells is lessened and the parasites are perhaps easier to find.

Sporulization occurs about one to two hours before the onset of the chill, so that blood taken just before chill time must be searched more carefully in order to find the parasite. The greater number of parasites are perhaps found in the peripheral blood during the sweating stage, when the skin is relaxed and the capillaries are flushed with blood.

Provocative doses of adrenalin may flush the parasite out of the bone marrow and deep organs.

Hereditary transmission of malaria does not take place. Most observers agree that prenatal infection does not occur.

A few cases of malaria in very young infants have been reported. Mannaberg (L1) gives the incubation period of malaria, which would vary with the number of sporozites introduced into the blood, as from six to twenty-one days. The youngest case I have ever seen was 17 days old. This, I wish to record here:

Baby H., white, female, age 19 days, was brought to my office from the Mississippi River bottoms of Crittenden County, Arkansas, in May, 1922, for high fever which had lasted two days, or since the child was 17 days old. The baby weighed seven pounds. Physical examination was negative, but a routine examination of the blood revealed tertian parasites in great numbers and in different stages of development. The temperature was 105° F., but the child had had no convulsions. The mother had chills before and after the birth of the baby, and the baby had been bitten by mosquitoes every day of its life. Recovery was prompt and uneventful. The patient and the blood was shown to several colleagues.

There is absolutely no truth in the popular idea that malaria tends to recur on the seventh, fourteenth, and twenty-first days.

The administration of quinin to children should be by mouth except in pernicious cases where the patient's life is in immediate danger. Here intravenous dosage is permissible, but only for the immediate crisis. The best method of administration is by capsule or tablet to older children, and in aromatic syrup of yerba santa or syrup juvans to younger children and babies.

(1) Bass' objection to quinin in solution on the grounds that such unnecessarily unpleasant doses will not be taken for a full and necessary period of eight weeks seems to me to be absolutely correct.

The 24-hour dosage may be estimated as ¼ grain for each pound of weight, or ¼ grain for each year of age.

(2) Bass calculates from his work in Bolivar County, Mississippi, that the doses necessary to disinfect children are as follows: under 1 year, ½ grain; 1 year, 1 grain; 2 years, 2 grains; 3 and 4 years, 3 grains; 5, 6 and 7 years, 4 grains; 8, 9 and 10 years, 6 grains; 11, 12, 13 and 14 years, 8 grains; 15 years and older, 10 grains.

These should be repeated about every 8 hours. Larger doses are no more efficient and may do harm to the patient.

The intramuscular injection of quinin is of such questionable value and is fraught with so much danger of injury to the tissues that I believe it will ultimately be abandoned.

The popularity of the intravenous use of quinin is truly alarming when we consider the crude methods of its administration and the absolute certainty of the relapse of the patient who is given only a few doses. I have been told by numbers of physicians that they gave "one shot and that was the end of it."

The intravenous injection of quinin is a dangerous procedure which may cause the death of the patient. Circulatory depression, nervous phenomena of various sorts, including paralyses, injury to sight and hearing, rapid fall of temperature by concentration of blood sugar, venous thrombosis, and where accidental extravasation occurs local necrosis and sloughing, are untoward results not to be lightly considered. Moreover, it has recently been shown that malaria is not more readily cured by intravenous medication.[3] Ninety per cent of the quinin injected intravenously disappears from the blood and is stored in the tissues in one minute.[4]

Acton,[5] in the *Lancet* for June, 1920, reports 100 cases treated intravenously

and orally for 8 weeks with 18 per cent of cures, while 190 cases treated orally with 30 grains daily for ten days gave 42 per cent of cures.

These results may be multiplied indefinitely. It is the overwhelming opinion of the literature—over 100 reports—that intravenous quinin makes the tissues quinin resistant.

This is the crux of the whole matter, and it applies especially to the child with his imperfect protective organism. His tissues become more easily quinin resistant. Intravenous quinin controls the clinical symptoms for the time being, but it retards and hinders his recovery.

To obtain the ideal results, "leaving unscathed the protoplasm of the host," we must sneak in, so to speak, our medication.

There is no stage in the life cycle of the parasite at which it is most readily destroyed by quinin, popular opinion notwithstanding. The time to give quinin is when the disease is diagnosed. The young parasite is not hatched out into a drug-filled and antiseptic blood where he meets death. Normal blood plasma destroys the parasite very quickly. Quinin increases the permeability of the red cell and allows the plasma to reach the parasite.

Treatment must be continued for a period of 8 weeks if we would prevent relapse, and the daily dose should be the same as that required to kill parasites during the acute stage.

The giving of quinin in the gastro-enteric disorders of hot weather, especially the giving of quinin in syrupy and chocolate mixtures to very young infants in conditions in which sugars are contra-indicated, constitute by far the most frequent instances of abuse of the drug which we as pediatrists see.

A majority of our referred cases of intestinal intoxications and infections present nervous symptoms, including vomiting, which are taken as indications of cerebral or meningeal irritation, which clear up on water, rest and food.

Are not these symptoms many times due to cinchonization?

During the past summer the author treated 5 cases received during one month and treated simultaneously in the Children's Ward of the Baptist Hospital, which follow:

Case I.—Baby McC., age 2½ years, breast fed, and never before had been ill. Three days previously it became sick with fever and frequent foul-smelling stools. On admission to the Hospital it was vomiting frequently, rolling its head continuously when aroused, and then lapsing into stupor. Temperature was 101° F.; pulse, 158; and skin cool and mottled in appearance. The blood showed polymorphonuclears, 52 per cent; large mononuclears, 10 per cent; small mononuclears, 38 per cent. Malaria was not found. The urine contained blood and albumin, but no casts. Stools, 1 to 4 daily, foul and full of mucus. There were indurations in the arms and hips from hypodermics of quinin. Quinin had also been given by mouth, but the amount could not be determined. The baby was dehydrated and very sick looking. Three hundred cubic centimeters of 2 per cent bicarbonate of soda was given intraperitoneally and water pushed by mouth all night, though this was vomited frequently. A dose of milk of magnesia was retained. Next morning barley water and dextri-maltose was given and retained. At that time it was discovered that the child was blind. Vision was found to appear and disappear throughout the next three days. The eye grounds showed nothing, though an expert did not examine them. Lactic acid milk was added to the malt sugar and barley and on the fifth day cereals, broths, etc.; and on that day the child was allowed to leave the Hospital.

Case II.—Baby M., male, white, age 9 months, was breast fed. He had been ill for 60 days with temperature running very high and after several days dropping to normal. At one time it had stayed normal one week. He had been treated for malarial fever and had received quinin grs. iv by mouth daily with additional quinin added to the mixture, besides various hypodermics of quinin. One day he received gr. xx, which produced collapse and coma, and it was thought the baby was dead. He had been breast fed entirely and was nursing every 15 to 30 minutes from a flabby breast and a frantic mother. His weight was 16 lbs. 2 ozs. on admission to the hospital. Temperature was 99° F., running up to 103° F. in four hours. The baby was in an extreme condition of acute inanition and was dehydrated. The skin lay in folds over the muscles and was devoid of all elasticity. The eyes were sunken. The child was irritable, vomiting and refused to eat. Three hundred cubic centimeters of Ringer's solution was given intraperitoneally, and two hours later condensed milk was forced with a spoon. Three hundred and fifty cubic centimeters of normal saline was given in the abdomen 12 hours later. The condensed milk was fed at three-hour intervals for 24 hours and then the baby was put on the breast and lactic acid milk with 5 per cent dextri-maltose given complementally. He left the hospital on the sixth day, having gained one

pound. This baby had been given the equivalent of 150 grains adult dose of quinin.

Case III.—Baby S. P., white, female, age 17 months, was breast fed. She had become ill 2½ months previously with pertussis, ran a temperature of 99 to 100° F. Ten days previously she had a rise of fever and a convulsion. Quinin was given every three hours day and night, a teaspoonful of cocoa-quinin with powdered quinin stirred in each dose. It is estimated that she received 30 grains daily. The child entered the hospital with a temperature of 104° F., was very restless and irritable, semi-delirious, rolling her head and was vomiting. The blood showed 23,900 leucocytes, 65% of which were polymorphonuclears. The urine showed numerous pus cells with clumping and motile bacilli in a sterile catheterized specimen. The lungs showed increased peri-bronchial markings by x-ray. Water was pushed by mouth and potassium citrate was given. The temperature dropped and the nervous symptoms rapidly cleared up. This child received an estimated adult dose of 180 grains of quinin daily.

Case IV.—S. H., white, a female, had had pyelitis four years previously. She had been ill for one week with a chilly sensation which had been followed by a rise of fever which preceded a heavy sweat. These chills occurred about every 6 hours. She had had 7 hypodermics of quinin dihydrochlorid in the previous 8 days and gr. iiiss by mouth every four hours, day and night. She was in a pitiable state of fright and nervousness, was restless, with her head rolling, and she had disturbed vision and tinnitus. The blood showed 10,000 leucocytes, 45 per cent of which were polymorphonuclears, and there was no malaria. The urine was loaded with pus. The child recovered promptly on water and alkalis. The estimated equivalent of the adult dose of quinin was 60 grains daily.

Case V.—Baby W., age 11 months, weight 15 lbs. 15 ozs., was breast fed. It had been sick for eight weeks with fever. It had been taking quinin gr. xvi-xx daily. It had constipation, vomiting, cried continuously, rolled her head, nursed every few minutes and vomited. Temperature 102° F., loss of turgor, dehydrated, pulse 130, respiration 26, liver enlarged, and spleen not palpable.

It was given 400 c. c. of 2 per cent soda bicarbonate intraperitoneally; its stomach was washed and it was fed by lavage lactic acid milk with 3 per cent dextri-maltose. Atropin was given before feedings. It was dismissed in eight days, gaining in weight. The daily dose of quinin given for eight weeks was the adult equivalent of 120 grains daily.

Five cases referred to one man at one and the same time, where quinin overdosage had influenced the clinical course of the disease, is not a mere coincidence.

I believe that careful histories will show that most of our hospital cases of gastro-intestinal derangements have been taking overdoses of quinin, given in chocolate and other flavored syrups, menstrua that in health are considered dangerous to infants in such quantities.

This statement is not made as a criticism of the country physician. The differential diagnosis of intestinal intoxication and malaria is the one we are most frequently called upon to make. In a malarious district and without a microscope, what would you do?

CONCLUSIONS

The laboratory test for malaria, if conscientiously and persistently carried out, is reliable in practically 100 per cent of cases.

The incidence of age does not affect the clinical course of malaria.

The abuse of quinin in its overdosage to children is almost universal throughout the South.

The giving of quinin in sugary syrups to infants and children with gastro-intestinal diseases may aggravate the existing condition.

The giving of overdoses of quinin may account for many nervous phenomena not otherwise explicable.

Madison Ave. at Somerville St.

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DISCUSSION

Dr. J. O. Elrod, Forsyth, Ga.—I am not from a malarial section, so I have not had very much experience with it. I feel as Dr. Rosamond does, that in cases where there is not a laboratory accessible, it is erring on the right side rather than on the wrong to give a therapeutic dose of quinin to these children. If we have laboratories more accessible, it is a great deal better to use them than to fill the children's stomachs with quinin.

Dr. W. A. Mulherin, Augusta, Ga.—I was interested in Dr. Rosamond's paper for the reason it expresses directly opposite views to those entertained by me as regards malaria in infancy. This year at the St. Louis meeting of the Pediatric Section of the American Medical Association I presented a paper on this subject. My observations and deductions were drawn from 300 to 400 private cases and from 50 closely studied cases of malaria in infancy and early childhood. The following differences between

malaria in infants and the disease in adults appeared to me to exist:

Afebrile Malaria.—With a history of no preceding febrile onset, a fair number of babies, breast fed, receiving plenty of breast milk, and with the blood showing malaria parasites, will run no fever, grow indifferent to nursing, stop gaining in weight, or lose slightly, and grow decidedly anemic. This condition may have existed for three or four weeks before medical advice is sought and the blood examined. Physical examination will result in absolutely negative findings in fully 30 per cent of cases, with no enlargement of the spleen and nothing to guide one to diagnosis from the clinical picture except the marked anemia.

Periodicity and Fever.—The medical mind rightly believes periodicity in clinical manifestations to be the most characteristic feature in malaria. This is true of malaria in the adult, and in children after three years of age. In Georgia—and I believe the same applies to the South in general—periodicity in subjective and objective symptoms of malaria in infancy is oftener absent than present. The younger the patient, the less frequently is periodicity found. Fever is remittent, irregularly intermittent or absent more frequently than regularly intermittent. This is not due to a preponderance of estivo-autumnal infection, but is seen in tertian infection. In and around Augusta, Ga., where my observations were made, tertian infection predominates over estivo-autumnal in the ratio of about three to one.

Probably the explanation for absence of characteristic fever in infancy may be found in the blood picture of tertian infection in the infant. Here all stages of development in the tertian infection are seen, more often than in the adult. The forty-eight-hour cycle of maturity of plasmodia in the infant's blood is probably not completed with the same regularity or periodicity as occurs in the adult. The host may account for the difference in cyclic development. Clinically, we know babies react differently from adults to infections of rheumatism, typhoid and pneumonia.

With the cycle of maturity more continuous, or more irregular than periodic, remittent and irregularly intermittent, rather than regularly intermittent, fever would be expected. The same frequent absence of chills, or its equivalent in babies (cold hands and feet, blue lips and nails, slight cyanosis or pallor, drowsiness or prostration) would somewhat substantiate this assumption.

Digestive Symptoms.—In infancy, gastric and intestinal disturbances are not uncommon symptoms in the early stages of malaria; vomiting in about 75 per cent and mild diarrhea (sometimes ileocolitis) in 25 per cent would be, I believe, a fair estimate. In general, it might be said that malaria is a great disturber of the normal functioning of the body of the infant and the very young child. If the child possesses latent tetany or a tendency to asthma or bronchitis, malaria will frequently excite these conditions to activity and give a varied clinical picture.

Enlargement of Spleen.—In adults, a palpable spleen, under careful examination, is, in the early days of malaria, a rather constant finding. In infancy, and up to three years of age, a palpable spleen is absent in fully 30 per cent of cases in the first week of illness. In a goodly number the spleen is not palpable throughout the entire malarial attack.

A word about standard treatment. I do not understand how Dr. Rosamond, Dr. Bass, or any other physician can say when a case of malaria is cured. By cure I mean thorough eradication of malarial organisms from the system. We know the tissues of the body can, and do, harbor malarial parasites for years. We further know that no amount of quinin given during an attack or subsequently will kill the plasmodia in the tissues. The only plasmodia killed by quinin are those in the circulating blood. A case cited by Dr. Gengenback, of Denver, Colo., at the St. Louis meeting above referred to illustrates this point. A Southern mother lived in Denver continuously for three years before the birth of her baby. The baby when three weeks old developed fever that baffled the Denver physicians. The blood was examined and malarial organisms were found. Quinin promptly cured the child. In Denver they have no mosquitoes. The baby had never been away from Denver, nor had the mother for three years. The mother's tissues must have harbored malarial organisms for at least three years. There had been no symptoms of malaria present in the mother, while living in Denver.

As to the practice of no plasmodia found, no quinin should be given, I cannot say I am in thorough accord on this point. We realize that the average physician, generally speaking, makes one blood examination and also that we do not secure 100 per cent positive findings. Therefore, when scientific methods have been applied to a case and have proven negative, and the clinical picture of malaria exists, the therapeutic test is not only advisable but mandatory. It should be remembered that we not only have science to subserve, but we also have a patient to treat. In short, my idea of the correct treatment of malaria is scientific treatment plus brains.

Dr. Rosamond (closing).—I do not believe that Dr. Gengenbach's case was malaria.

Dr. Mulherin.—It was found in the blood.

Dr. Rosamond.—There is no other case on record, so I would accept this one with reservations in view of the millions of babies born in malarial countries and the thousands of competent observers who have spent years looking for the opportunity to be the first to present such a case. Theoretically, if enough mosquitoes could bite a baby shortly after birth it might develop malaria in forty-eight hours' time, but it would take millions of bites.

Dr. Mulherin.—The mother conveyed it to the child through the blood.

Dr. Rosamond.—Then it is the only case on record. I would accept it with a grain of salt because it has not been accorded the place in the literature due so remarkable a case. Malarial investigators do not believe placental transmission possible.

A FAMILY GROUP OF TYPHOID SIMULATING MENINGITIS*

By Harvey G. Beck, M.D.,
and
Ferdinand A. Ries, M.D.,
Baltimore, Md.

On October 21, 1921, R. J., a colored boy, aged 14 years, was admitted to our service at the Mercy Hospital. He presented all the characteristic symptoms of typical cerebrospinal meningitis. The spinal fluid, blood cultures and Widal reaction were repeatedly negative. Before his cerebrospinal symptoms subsided his brother, J. J., aged 5 years, was admitted, on November 12. The mode of onset, clinical symptoms and laboratory findings were almost identical, and they both developed bronchopneumonia while in the Hospital.

The following day, November 13, the third brother, M. J., aged 12 years, was admitted. He also had meningeal symptoms, namely, intense headache, photophobia, disturbance of speech and facial paralysis; but the constitutional symptoms were not so pronounced. A history was obtained that the father, who lived on a small farm, was sick several months previously with a fever, which was suspected to be typhoid.

The following is a brief report of these three cases:

Case I.—R. J., aged 14 years, began to complain on October 5 (sixteen days prior to admission) of headache, stiffness of the neck, huskiness of the voice, malaise, anorexia and cough. On the day of his admission his nose bled and he developed a delirium and stupor. He continually groaned and could not be aroused. Subsultus tendinum was present. His temperature was 105.8°, pulse 120, and respiration 30. The eyes were staring; pupils sluggish and photophobia marked. Herpes appeared on the lips. The head was retracted, and there was great rigidity of the muscles of the neck. On examination of the chest, signs of a bronchopneumonia were revealed. Heart action was rapid and the valvular sounds were normal. The spleen was not palpable, although the area of splenic dullness was slightly increased. Brudzinski's and Kernig's signs were positive. Blood cultures were persistently negative. Repeated agglutination tests were negative until after the end of the febrile period, when a positive reaction to the typhoid bacillus was obtained. Typhoid bacilli were isolated from the stool. Numerous blood counts showed a moderate grade of anemia with a hemoglobin of 70 to 75 per cent and an average red count of 3,990,000. The white cells ranged from 4100 to 7200. The differential showed a low polymorphonuclear count ranging from 34 to 57 per cent, small mononuclears from 37 to 61 per cent and large mononuclears from 2 to 5 per cent.

A coarse tremor of the right side of the face, including the upper lip, developed three days after admission. This persisted for about one week. At the same time he developed a positive Babinski sign on the right side and a catatonic state of the muscles, especially those of the arms. Two days later, when the stupor cleared up, photophobia became so intense that the fundi could be examined only with great difficulty. The ophthalmoscopic examination was essentially negative, except for white, elevated areas at the upper and lower margins of the left disc and distention of the veins. The muscles of the left side of the face were paralyzed. Several lumbar punctures were made and the spinal fluid revealed normal pressure and a normal cell count and globulin content, and cultures were negative. No rose spots were observed. After the subsidence of the symptoms of acute meningitis and bronchopneumonia the temperature curve and general course were typically those of typhoid fever.

Case II.—J. J., aged 5 years, on November 5 showed dullness, apathy and anorexia. Four days later he developed a delirium and on the fifth day photophobia. His temperature on the day of admission was 105°, pulse 120, and respiration 36. At times he gave a prolonged, shrill cry. He was restless, tossing about, and showed a tendency to lie on the abdomen or on the side, rarely on his back. There was marked retraction of the head and stiffness of the neck. In an attempt to flex the head on the thorax, rigidity was so great that the body was elevated. Photophobia was marked. Herpes labialis was present. Cutaneous hyperesthesia was general and so pronounced that the slightest touch provoked an outcry. The heart was normal. The lungs showed signs of bronchopneumonia. The spleen was palpable. Kernig's sign was strongly positive. Five days after admission subsultus tendinum and bilateral ptosis and strabismus of the right eye developed.

The meningeal cry and muscular rigidity were still present on the seventh day after admission, but the eye symptoms began to subside. The blood examination yielded practically the same results as Case I except for a slightly higher leucocyte count and a less marked lymphocytosis. Blood cultures and spinal fluid were repeatedly negative. The Widal was also negative until late in the course of the disease, when it became positive. The stools contained typhoid bacilli. There were no striking abdominal symptoms and rose spots were not detected. The fever terminated by lysis.

Case III.—M. J., aged 12 years, also showed meningeal symptoms, but were milder in degree as compared with the other two. The onset was acute and began on November 9 with photophobia, intense supraorbital headache, restlessness and anorexia. On admission, November 13, temperature was 101.4°, pulse 100, and respiration 22. The examination was practically negative, except for severe photophobia and slight aphasia with a drawling speech. Eleven days after admission he developed pa-

*Read in Section on Pediatrics, Case Report Session, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

ralysis of the right side of the face, which persisted for four days. The differential count showed a marked variation from the normal between the polymorphonuclears and lymphocytes, the former ranging from 26 to 52 per cent, the small mononuclears from 22 to 63 per cent, and the large from 9 to 23 per cent. The spinal fluid was normal. The Widal was negative on November 16 and positive on November 20, eleven days after the onset. Typhoid bacilli were recovered from the stool.

SYMPTOMS IN COMMON

In the three boys meningeal symptoms predominated in the early stage of the disease, but cleared up before the end of the febrile period. The fever terminated by lysis and was fairly typical in its course and characteristics of typhoid fever. Rose spots were not observed in a single case. The stools were not characteristic of typhoid macroscopically. Blood cultures and spinal fluid were persistently negative. Widal was positive late in two cases and early in one of the cases, and in all cases the stools were positive for typhoid bacilli. Two with the severest symptoms developed bronchopneumonia. The blood picture was very similar in all the cases, the polymorphonuclears steadily decreasing, the lymphocytes proportionally increasing during the progress of the disease.

Great diagnostic difficulties were encountered in these cases. In the first case cerebrospinal meningitis, miliary tuberculosis, encephalitis lethargica and acute poliomyelitis had to be considered. When the second case was admitted with the same group of symptoms the epidemic nature of the affection practically ruled out acute miliary tuberculosis and encephalitis. Up to this time, typhoid was only considered a remote possibility, especially in the absence of clinical and laboratory diagnostic proofs. Botulism also entered into consideration, but was excluded by the subsequent course of the disease, as were poliomyelitis and miliary tuberculosis because of the transitory stage of the symptoms of paralysis. It was not until after the third child was admitted and the typhoid organism recovered from the stools that the diagnosis of typhoid was definitely established. This was further confirmed by positive agglutination reactions, which were finally obtained in all the cases before they left the Hospital.

Attention has been called to the fact that typhoid fever during certain epidemics shows profound nervous symptoms, meningeal in type, which occur during the course of the disease with varying frequency, at times in a large number of cases. They occur almost exclusively in young individuals, often late in the febrile period. However, they may occur as early as the first or second day of the fever, especially in children, and may so dominate the clinical picture that diagnosis becomes extremely difficult, the real nature of the condition being recognized only when enlargement of the spleen, diarrhea and roseola appear. There seems to be either a selective affinity for typhoid toxins or a seat of predilection of the typhoid bacilli in certain strains of the organism. This would account for the greater incidence of meningeal complications in some epidemics than in others. This point is well illustrated in a milk epidemic of typhoid, observed by Curschmann, in which five nurses were taken in quick succession, all of whom developed meningeal symptoms which predominated the first week. He designated these as cases of "meningotyphoid."

TYPHOID FEVER IN CHILDREN

While infants enjoy a relative immunity to typhoid fever, children are quite as susceptible as adults, but they are more resistent to the typhoid toxemia. The cases are milder, the duration shorter, and more are of the abortive type. The pulse is more rapid, vomiting more frequent and diarrhea more constant, convulsions and meningeal symptoms are not rare, and transitory aphasia occurs more frequently in children. There is more variation in the temperature curve and the pulse increases in proportion to the temperature. Dicrotism is rare. The stools resemble those of ordinary diarrhea, tympanitis is not severe, and gurgling and tenderness are infrequent. Under six years of age hemorrhage and perforation rarely occur, eruption appears early, and the spots are fewer in number and less distinctive. The low leucocyte count is not found in the very young. A count below 6000 is strongly suggestive of typhoid fever. Complications and sequelae are less common.

Nervous Symptoms. — The nervous symptoms in typhoid fever may be (a) toxemia, (b) pathological changes in the meninges, or (c) demonstrable lesions in the brain or cord.

Toxemia.—The intensity of the nervous symptoms due to toxemia are out of proportion to the pathological findings.

Pathological Changes in the Meninges.—The dura may show hyperemia and adhere to the inner surface of the skull. The pia arachnoid may show edema-

tous infiltration, injection and adhesion with small round cell infiltration (in the more severe cases) continued along the vessels into the brain. Subarachnoid hemorrhages and purulent meningitis are rare. Some cases show symptoms that are dependent upon macroscopically or microscopically demonstrable lesions. During some epidemics profound nervous disturbances occur which can be ascribed only to acute inflammatory processes involving the meninges. In these cases stupor is very slight. The patient complains of very severe headache, photophobia, vertigo and tinnitus. Pain in the back of the neck and rigidity set in. Twitching is present. The reflexes are hyperactive. Facial herpes is present. The intensity of the cerebral symptoms is not proportionate to the constitutional manifestations. The duration of the meningitis is variable, sometimes five to twelve days, sometimes throughout the greater portion of the febrile period. In these cases the findings vary from simple hyperemia to purulent meningitis. This type occurs ordinarily in children.

Pathological Changes in the Brain.—Symptoms depending upon lesion of the cerebral tissue and its vessels are infrequent. When present they occur during the last part of the febrile period or convalescence. There may be embolism or thrombosis with cerebral softening. Suppuration is rare. Alterations of the cord are uncommon, although they do occur and give rise to symptoms suggesting Landry's paralysis.

DISCUSSION

Dr. James H. Atlee, Chattanooga, Tenn.—Typhoid fever used to be considered a disease of adult life and was very seldom seen in children, but we see typhoid fever among infants and children more frequently than is supposed. In the last few years since the sanitary conditions have improved we have very few cases of typhoid fever in Chattanooga. One case I saw was a child of six months whose father had died a few months previously of typhoid fever. The diagnosis was confirmed by culture and the child made a complete recovery. Of course, you all know that the course of typhoid fever in infants and children is very mild. They quickly run through a week or ten days and the treatment is symptomatic.

Dr. Beck (closing).—I would like to call attention to the fact that in some of the epidemics among children the mental manifestations occur quite commonly. This was rather a surprise to me when I looked up the literature. Epidemics are cited in which the disease frequently resembled very closely meningitis. Kerschner called attention to an epidemic in which the mental symptoms predominated. In children, as Dr. Atlee said, we are more apt to have variations from the normal type. Typhoid in children is quite a different matter from typhoid in adults. We found in our service at the Mercy Hospital during the past three or four years, since typhoid fever is relatively decreasing, that we have more atypical cases and experience more difficulty in diagnosing these cases. It was really only after the third case of our group was admitted and after we found the Bacillus typhosus in the stool that we were sure we had to deal with typhoid. The duration of the mental symptoms was from four to seven or nine days, and they all appeared early in the disease. The onset began with convulsions and mental symptoms in all three cases. I think they are a unique family group and worth while presenting because of the number occurring in one family.

TROPICAL DISEASES AND PUBLIC HEALTH

SYMPOSIUM ON MALARIA

DEVELOPMENT OF MALARIA CONTROL WORK IN ALABAMA ON A COUNTY-WIDE BASIS*

By S. W. Welch, M.D.,
State Health Officer,
Montgomery, Ala.

In the fall of 1917 and throughout the entire year of 1918, the United States Public Health Service did a very thorough malaria control work around Camp Sheridan in Montgomery, Camp McClellan in Anniston, and in the Muscle Shoals district. This work consisted of thorough drainage of a one-mile zone around the camps, oiling places that could not be drained, and stocking the waters with top minnows. Much of this work was neglected after the troops were removed from the several camps and work was discontinued at Muscle Shoals. I wish, however, to give public and official recognition of this valuable piece of public health work done in Alabama by the United States Public Health Service. It was the beginning of the end of malaria destruction in the South.

The State Board of Health of Alabama had a very inadequate appropriation at that time and could continue the work only along the lines of distribution of top minnows in all the waters of the State. The value of this single activity cannot be over-estimated.

In 1920, a cooperative work was begun with the United States Public Health Service, the International Health Board and the State Board of Health, working in small centers of population. There were seven projects of this nature worked in 1920, cooperating with these several agencies, and four or five others done independently by the Alabama State Board of Health. This work proved so satisfactory that five counties were selected in 1921 and placed under the supervision of an engineer and the work was begun on a county-wide basis. It was decided that work in the small communities, while a most excellent method of advertising, was a waste of time, money and energy. One engineer operating through the county health officer and his rural inspector could cover a whole county with the same time and expense as were necessary to cover one community in several counties.

The success of this plan of operation was clearly demonstrated by Mr. Johnson in 1921. The results of the demonstration were placed before the International Health Board and the United States Public Health Service, which gave their approval. A plan to take twenty counties and administer them in the same manner in 1922 as the five counties had been administered in 1921 was worked out. The work of 1922 has vindicated the feasibility of this plan of operation. The International Health Board and the United States Public Health Service have placed a number of egineers in Alabama. They have been assigned to zones of activities. Eighteen counties have been worked. The small towns that have applied for assistance have had assigned to them an engineer to supervise the work and a small subsidy added.

The most notable piece of work of this kind has been done in Mobile, a large center of population. Dr. Griffitts was assigned by the United States Public Health Service to the local Health Department. The City and County of Mobile put up $30,000 and the State and International Health Board $5,000, which was disbursed by the County Health Officer. This has been pronounced the best piece of malaria control work of its kind which has been done in the South.

A large number of small projects have been put over in a number of other counties, making twenty-seven of the more malarious counties which have had malaria control work done in them. It is fig-

*Read before the National Malaria Committee (Conference on Malaria), meeting conjointly with the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

ured that it will take a minimum of five years to clean up a county. We have attacked those counties which have a large malaria incidence. We figure that if we control our worst areas there will be a tendency for the disease to die out in the less heavily infected areas. The demand from smaller towns for assistance is growing. The demonstrations which have been made in the towns of Hartford, Dothan, Demopolis, Brewton and Eufaula have been outstanding in their success.

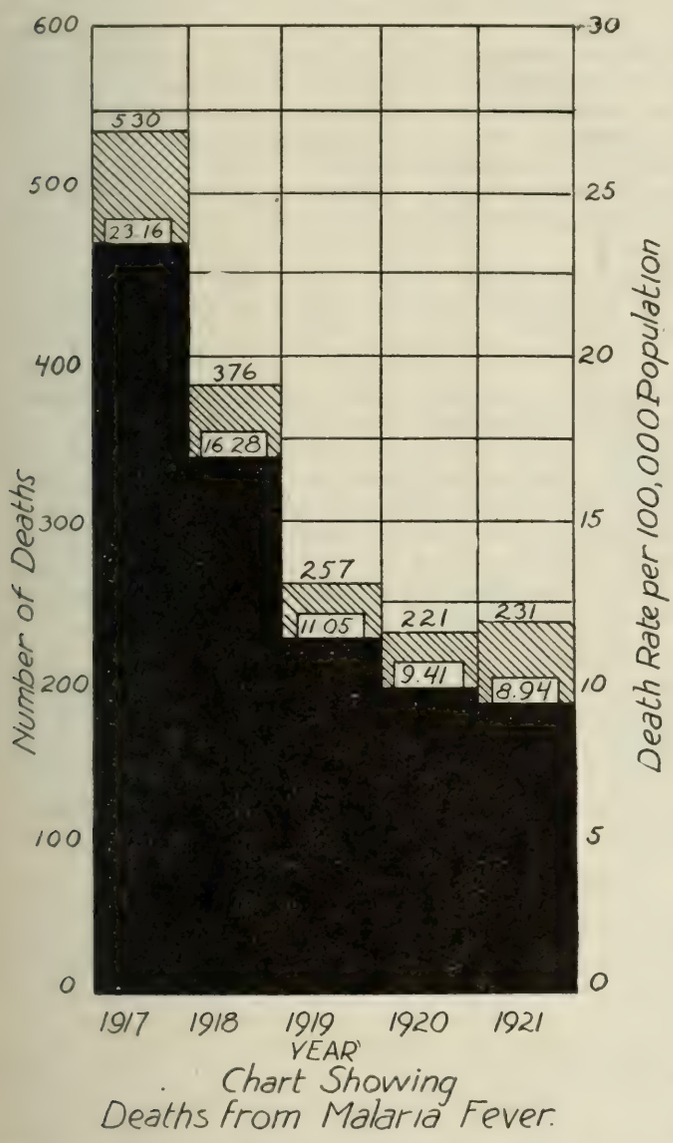

Chart Showing
Deaths from Malaria Fever.

It is a notable fact that in these towns not a single case of dengue fever of home origin occurred during the past season — demonstrating that the malaria control work had gotten rid of the culex and stegomyia mosquitoes and there were no conveyors left to distribute the disease.

We plan to continue the work in the twenty organized counties for the next four years, following up the same methods which have proven successful in the last two years, and also to do project work in the small centers of population whenever they apply.

The method of working the counties is for the State Engineer to go to the health officer of a county and the two work out a plan of operation for the county. The engineer surveys the territory, lays off the ditches and makes a report to the State Board of Health, the International Health Board, the United States Public Health Service, and to the county board of health. The health officer then, as the executive officer of the county, puts the construction work in charge of the county inspector. The engineer visits the work from time to time for the purpose of seeing that the construction work is properly done. Where drainage cannot be obtained, oiling is advised and the inspector sees that this work is done.

The interest of the whole population of the State has been aroused by the successful campaign. Large areas of farm lands have been drained because of the agricultural benefits which have been found to come from the demonstration areas drained by the engineers for malaria control purposes. In the counties of Talladega and Calhoun more farm drainage has been accomplished in the last two years than in the previous ten years, and the malaria incidence of these two counties has fallen to a negligible quantity. This work has not cost the State Board of Health anything except the salary of the engineer. It has been done by the owners of farm lands, and while agricultural drainage is primarily the object in view, malaria control has been an outstanding by-product of the effort. It is one of the objects of the engineers to impress upon the farmers of the State the value, from a health standpoint, of drainage of low lands on their farms, but he does not neglect to tell them of the increased value of having this fresh alluvial soil which will produce from three to fourfold more than the uplands. When the farmer becomes interested, the engineer lays off the ditches and the farmer constructs them.

There are three very extensive agricultural drainage districts now projected in

the State which will control a very extensive malaria breeding area. The State Board of Health will cooperate with these commercial enterprises.

A law was passed in 1919 requiring any company doing construction work in the State, such as highways, railroads, or any other construction work, to drain all borrow pits, thus leaving no place where man-made malaria could be found. Regulations formulated by the Federal Power Commission for the government of impounded waters on navigable streams have been of much value. In the impounded waters of Mitchell Dam, now being built by the Alabama Power Company, something like seventy-five ponds have been built and stocked with top minnows which will be released when the waters are impounded and rise to the level of the ponds. The army of destroyers will be ready to attack the invading mosquito hosts when the spring time opens.

Top minnows have been distributed lavishly in all the waters of the State, and we believe that this natural enemy of the anopheles larvae has been the most potent single force in the reduction of malaria.

The State Board of Health has been working upon regulations governing the impounding of water for more than a year, but has not yet been able to formulate satisfactory regulations. We have taken the advice of our distinguished leader, Dr. Henry R. Carter, who advises us that "the work had better be done right than quickly."

As a result of this work the number of deaths from malaria in Alabama has fallen from 530 in 1917 to 231 in 1921. The number of deaths in 1922 will probably be less than that of 1921.

In the light of these facts, we feel that we have adopted the proper method of malaria control work in Alabama and feel that we are making substantial progress. If the cooperative agreement worked out between the United States Public Health Service, the International Health Board and the State Board of Health can be maintained, we are justified in forecasting a malaria free state within the next few years.

DISCUSSION

Dr. W. S. Leathers, State Health Officer, Jackson, Miss.—It seems to me that Dr. Welch has very properly placed emphasis upon certain phases of malaria control work. It is evident that much attention is being given to educative methods in getting the people aroused relative to cooperating with the State Board of Health in the prevention and suppression of this disease. I feel sure that insufficient emphasis has been placed upon educational work in the control of malaria, generally speaking. It is true that during the past several years the various state boards of health in this country have been passing through a pioneer stage in the control of this disease and the method of demonstration has been necessary in so far as it has been used in municipalities for convincing the people of the possibility of preventing malaria and also in teaching them the methods which should be employed for this purpose. It is perfectly evident that no better method can be used in the prevention of any disease than that of demonstration. It is in the true sense of the word educative in its effect upon the public, but I wish to emphasize especially the desirability of giving more attention to educating the children in the public schools relative to the cause of malaria, its prevention, and its economic relation to the development of a state. If we could uniformly bring before the school children of the country the facts about malaria which we now know to be sane and practical, it would appear to me the most substantial step that could be made in the reduction and ultimate suppression of this disease. So fundamentally the whole plan of malaria control should be educative.

I think there is no question about the fact that the plan to be used in the future should be one that is applicable to a county as a unit of organization. It would seem to me that sufficient demonstrations have been conducted in municipalities and that now more emphasis should be placed upon the county-wide plan.

I think all of us realize the fact that in controlling malaria it is practically impossible to eradicate it from any particular area unless the plan of work be sufficiently extensive to cover a large territory so as to avoid the possibility of reinfection in areas where control measures are being instituted. There is another point that needs to be emphasized, and that is in instituting measures for the prevention and control of this disease, that permanent health organizations should follow in the wake of such work or precede it.

It is obvious that in controlling malaria in a particular area methods used should be adapted to local conditions. It may be necessary to use drainage as the major agent, or possibly quinin in the sterilization of the blood. Under certain conditions screening would be the method to be emphasized, and the top minnow should be employed in streams and small bodies of water. It is certainly important not to emphasize unduly any particular method, and, therefore, it is imperative to make a careful study of the results

to be obtained in drawing conclusions with reference to the effectiveness of the methods to be used or which are being used.

It is, of course, important to secure the cooperation of all local agencies such as the Rotary Club, the Kiwanis Club, the Parent-Teacher Association, the Chamber of Commerce, county and state officers, and so forth. There is perhaps no more important point to emphasize educationally speaking than the economic aspects of malaria control work, the bearing of it upon the agricultural development of the country, and what it means from the standpoint of increasing land values. This can be shown in a concrete way so as to impress the mind of the business man.

Incidentally, in the cotton-producing states malaria is at its worst during the time cotton is being picked and labor is most needed, and as a result of the high incidence of the disease it often proves disastrous to the farmer or planter. By making a careful survey of the malaria incidence of the county the per capita cost of malaria can be shown, comparatively speaking.

In doing drainage work, not only are the agricultural conditions of the country improved, but in exterminating the mosquito it is made more comfortable for living purposes.

Dr. Welch referred to the fact that in Alabama the deaths from malaria had been reduced about two-thirds. This is rather a remarkable showing, and in this connection I wish to state that deaths in Mississippi have been reduced about 50 per cent. I believe we have a more serious problem because more than half of the population of the State are negroes. It is of interest to note that the Delta, which includes about fourteen counties and parts of counties, constitutes one-seventh of the area of Mississippi; and in this territory there is a large percentage of the tenant class, chiefly negroes. In this area about 50 per cent of the malaria of the State is found.

The incidence of malaria in Mississippi during the year 1915, according to the reports received by physicians, showed approximately 150,000 cases. The reports for the year 1922 show approximately 106,000 cases. This shows a definite reduction in cases and reference has already been made to the decrease in morbidity from this disease.

It is most gratifying to know that malaria is being reduced not only in Mississippi but throughout the entire South, and I predict that in the next twenty-five years malaria will be reduced throughout the Southern states where it is now prevalent not less than 75 per cent both in cases and deaths, and in many areas it will entirely disappear.

I feel that in this work we should give proper recognition to the splendid cooperation received from the International Health Board and also the assistance which is being given by the United States Public Health Service. Dr. W. D. Fricks, who is at the head of the malaria control work of the United States Public Health Service, is rendering invaluable service to the state health officers in their effort to promote this phase of public health work.

Dr. L. L. Williams, Jr., Past Assistant Surgeon, U.S.P.H.S., Richmond, Va.—We are very much interested in this particular phase of the work that Dr. Welch has just read. He is fortunate in one respect. He said that this year he extended the work into twenty counties, grafting it on to the county health departments. If we had twenty counties in Tidewater Virginia with county health departments we would feel that we were fortunate. We have just one county health department in Tidewater Virginia. Our main problem is to get permanent organizations in the counties. We feel that we cannot do satisfactory work without them. We have done a sufficient amount of work to prove that we can, with the assistance of cooperative funds, at least, secure county health departments in the rural districts. We have done it in one county so far, and they are undertaking rural control of malaria.

I notice that Dr. Welch and Dr. Leathers both said, and I have heard people say for a number of years, that you must hitch up agricultural drainage and mosquito control and the prophylactic use of quinin, but in our counties we put screening first. We find that if the drainage is scattered we do not get immediate results. It is too far distant to look for a sufficient result, so we put rural drainage last on the control program.

We have seen no great success from quinin campaigns, and I do not think that any one before us has, but I do not see why we should not have great success from screening campaigns. We believe that in a county with a permanent health organization, where an adequate county-wide screening campaign goes on, with the county health department on the job all the time to keep up the education, we can get better malaria control in that way than in any other that has been tried.

Dr. H. R. Carter, Assistant Surgeon-General, U.S.P.H.S., Washington, D. C.—In the Wilson, Va., campaign what we depended upon was drainage. We did screen, and perhaps the most important single thing we did was to raise the pond. There were 411 cases in the district. There had been 418 people there, but seven had died of it. There was a marsh left by an old saw mill pond, some streams that were breeding mosquitoes, and a pond over a hundred years old that was breeding anopheles freely. We cleared the banks and raised the pond, and we screened. I think the main thing done was raising the pond and drainage, though screening certainly helped.

I want to congratulate Dr. Welch. I had no idea that so much and such successful work had been done in any state.

The reason why the municipalities are taken care of first is that the work in them does give a bigger return for each unit of expenditure than in the counties.

To have reduced the malaria death rate by 56 per cent in Alabama, to have taken up twenty-seven counties, and to believe that possibly in five years more all of Alabama will be controlled, is to me wonderful.

Dr. James A. Hayne, State Health Officer, Columbia, S. C.—We have been confining ourselves to demonstration methods, drainage, etc. That has been quite successful, and we hope later to put on the county work, though we feel that probably we shall be shooting at the moon in trying it there. I do not think that we shall ever be able to make a hundred per cent demonstration in any county in South Carolina.

Mr. George Parker, Sanitary Engineer, Jackson, Miss.—It appears to me, from whatever angle we view the malaria control work, that we must first base our program upon a budget.

We must have the appropriation to carry on the work, for otherwise, of course, we cannot function at all. We must get before the people the proper conception of what the malaria problem is, so that we can get the proper appropriation to carry on the work. We must pay more attention to the educational features, as Dr. Leathers intimated. We must let the people know what the problem is, what we are trying to do, and why we are trying to do it, disregarding the health benefits that may come so far as their bodily comfort and peace of mind are concerned.

We can commercialize the malaria program, or any other health program, for that matter. Figure it from an economic standpoint. Take the assessed values for taxation and we shall find that probably 1 per cent will be enough not only to carry on malaria control work, but enough to sustain and carry on a full-time county health department. The people will not understand this until it is brought to them in a business-like manner. We must put our malaria control work on a business basis and show the people that we are going to spend the money in a business-like way, and pay them a dividend upon the money spent. When we do that there will be no difficulty in obtaining an appropriation. When the figures are compiled and presented to the board of supervisors or board of commissioners in such a way that they cannot tear them to pieces and make them appear false, we shall be successful in getting the money for the work.

In Mississippi, where I have been working this year, we have a state almost entirely devoted to agricultural purposes, so in carrying on the work we must realize the value of malaria control to agriculture. We take into consideration the cooperation we can get from the agricultural agents, the agricultural high schools, etc.

The agricultural agent is in the county principally as an expert adviser along agricultural lines. If through him we can demonstrate to the farmer that his land can be drained and made to produce a certain kind of crop which will give him returns in addition to what will be gained from the control of malaria, he will be more likely to do the work. He increases his man power and improves his land by getting rid of mosquito-producing areas.

There is so little of the spectacular about malaria control work that we cannot put it on a health basis alone, but must consider it a commercial problem. This will reflect directly upon the legislature, and serve to help secure appropriations for the state boards of health.

Dr. Clinton A. Kane, Director Malaria Control, State Board of Health, Richmond, Va.—I want to say a few words about what we are doing in Virginia in malaria control through the school course as conducted in seven counties in Virginia.

During the past year three hundred schools conducted a ten weeks' course, one hour weekly, the pupils using Dr. Carter's Primer and the Virginia Malaria Catechism. For the teachers we used literature and pamphlets as issued by the United States Public Health Service. At the end of the ten weeks' period examinations were conducted by the teachers and the best and poorest papers were sent to the State Health Department.

We followed up the course by field demonstrations in as many schools as possible. We propose this coming year to extend this course to all the schools in the malaria section, about 1,000 in all.

We further propose to establish a camp for field instruction for boys selected from different Boy Scout organizations. This course is to be extended over a period of two weeks.

Mr. L. M. Fisher, Sanitary Engineer, Columbia, S. C.—I noticed during the year, in reports sent to us of the work in different states, the drainage work in some counties was reported one hundred per cent complete, and I would like to know approximately how much drainage work was involved in a county, how many miles of ditches, etc., and what the cost of it all was.

I would also like to bring up this point. Dr. Welch quoted the deaths in Alabama as being reduced from 530 to 231—530 in 1917, 231 in 1921. The question of the natural reduction in malaria cases comes up in my mind. We had in South Carolina, about 1916 or 1917, some 500 deaths from malaria, too, but last year there were only 254. I do not think that our work accomplished much of that reduction, and I would like to have a discussion as to just what part the natural reduction of malaria played.

In South Carolina we are confronted with this problem: we have only six county health departments functioning now and only one of them is in the malaria-infected section of the State. It is almost impossible, it seems, to me at least, to organize a full-time county health unit in those counties in which the colored population is larger than the white, and I would like to know what the best procedure would be in that kind county.

Mr. W. G. Stromquist, City Health Department, Memphis, Tenn.—We all know that the general opinion throughout the North is that the Southern states are very unhealthful places in which to live, and that a great number of people hesitate to move here, even though better economic opportunities are offered.

In a recent weekly report of the Public Health Service there was a statement of the number of full-time county health officers in the various states. In the eleven states of the malaria belt, there were 112; in eighteen other states, 105; and in nineteen Northern and Western states, none. This shows that in the malaria belt there

are more full-time county health officers than in all the rest of the United States. Of course, the mere appointment of full-time health officers does not necessarily solve the problem, but it shows that the people are aroused to the need of public health work and that we are making rapid progress. As we attack and overcome the problems which are found only in this section, the problems which we have in common with the other states will also be included, and in a not far distant time the South may lead the rest of the country in sanitation.

Dr. A. P. Harrison, State Board of Health, Austin, Tex.—I have been appointed a committee of one to present to the National Malaria Committee a message from Texas, informing you of what we hope to be able to carry out during the next year's work in that State.

In approaching the problem of malaria control and the general problem of mosquito control, we consider it important to place this problem before the public as coming from laymen rather than from the State Board of Health, for various reasons. It was essential, of course, to obtain an appropriation from the Legislature. Now, legislatures are prone to consider any proposition coming from the health department as a health problem alone, and perhaps a hobby of the state health officer. Therefore, we have interested the Texas Chamber of Commerce, and we recently had a very successful meeting in Houston. During that meeting plans were formulated, which are embodied in some resolutions that I should like to read to you. The resolutions, I am sure, are perfectly self-explanatory.

Before reading the resolutions I may say that the recent epidemic of dengue fever in Texas was really a Godsend in one respect, because it did more to arouse interest among the general public in mosquito and malaria control than possibly anything else could have done.

SUGGESTIONS FOR MOSQUITO CONTROL CAMPAIGN

Be it resolved by this convention, called by the Texas Chamber of Commerce to consider state-wide mosquito control, that the following be adopted as resolutions by the Texas Chamber of Commerce:

(1) The division of the malaria and dengue belt of the State into districts containing not more than ten counties to each district.

(2) The appointing of ten men whose duty it is to organize the counties in each district, and to direct and carry out the necessary control measures therein with the help of assistants; it being the further duty of the above mentioned ten men to raise the necessary financial assistance from the cities and counties in each district.

(3) The raising of the necessary funds to provide the salaries and necessary traveling expenses of these ten men, which funds reckoning from past experience in obtaining the services of trained men, who alone could do efficient work, would amount to fifty thousand dollars.

(4) It is suggested that this amount be requested of the Legislature as a special emergency appropriation. The money for actual field control measures to be supplied by the cities and counties cooperating and participating in the work.

(5) It is further suggested that the Texas Chamber of Commerce request each and every secretary of every chamber of commerce in Texas to assume the responsibility in his district of assisting to raise the necessary funds for local control measures and to stimulate interest, thereby obtaining the cooperation of the people.

GENERAL MEASURES

(6) It is thought to be essential that adjacent states also carry on mosquito control work, particularly along the borders of the states adjoining Texas. It is, therefore, suggested that a resolution be drafted and adopted encouraging such work in neighboring states, and that the health officers of these states be sent a copy of this resolution.

(7) It is believed to be most important that the Mexican border be protected by such control measures, and a resolution is suggested requesting the Surgeon-General of the United States Public Health Service to render all the assistance possible in this respect.

(8) The following committees are suggested:

(a) A permanent committee to stimulate the necessary legislation and request the necessary appropriations.

(b) A permanent committee to handle the necessary publicity of the campaign.

(c) A permanent committee to educate and inform the public of the necessity for this work, including the obtaining of the cooperation of railroads, and all large industrial concerns. This committee should request all hardware dealers to sell for the purpose of screening against mosquitoes only screen wire of 16 or more mesh to the inch.

Whereas, we as an organization having the welfare of our State and the betterment of living conditions therein as our chief reason for existence, realize the fact that there is annually within our State an enormous economic and financial loss on account of preventable diseases, which diseases at times, by reaching the proportion of epidemics, cripple the business machinery of our State and its commercial, financial and social undertakings, not to mention the far more important fact of the loss of human life and the suffering and hardships which these diseases inflict upon our citizens, we further realize the fact that through judicious inauguration and conduction of tried and proven health measures under the direction of our State Health Department these diseases may be controlled, materially reduced and even be eradicated.

Whereas, we further realize and know that in order to conduct such health measures there is an absolute necessity for the appropriation of funds on the part of the State to finance these undertakings, and enable the Health Department to afford the protection to our citizens which it can do in no other way,

Be it resolved, That the Texas Chamber of Commerce, now assembled in special meeting for the purpose of considering the ways and means to combat preventable disease in the State of Texas, does hereby earnestly request the Legislature of the State to accede to the rquests which will be duly presented to that body by our State Health Officer, and provide the State Health Department with adequate funds, which funds are now a matter of vital necessity to the success of the protective measures contemplated.

Be it further resolved, That each local secretary of every chamber of commerce in Texas be, and is hereby, requested to explain to his representatives and State senators the necessity for this assistance, and that each local chamber of commerce pass resolutions respectfully requesting its legislative representatives to support the program of the State Health Department as one of the most vital interests of the State of Texas.

Be it further resolved, That a copy of these resolutions be sent to the Governor of the State, respectfully calling his attention to the campaign and requesting him to embody in his message to the Legislature a special request to consider carefully these requests to support the program of the State Health Department with a special consideration for an appropriation for the mosquito control.

Be it further resolved, That in order to inform the public of the proposed measures for their protection, and the necessity for their support and cooperation, a copy of these resolutions be given to the Associated Press of the State.

Dr. Roy K. Flannagan, Assistant Commissioner, State Board of Health, Richmond, Va.—The work done by Dr. Clinton A. Kane, Director of Malaria Control, and Dr. L. L. Williams, United States Public Health Service, who have charge of the anti-malaria work in Virginia, has given excellent results. They are carrying on the campaign along all lines. They are featuring the distribution of literature in malarious sections. I would like you to see the concise little bulletin that is being distributed broadcast through the schools. Though funds are limited, they are not neglecting to do drainage work. I hope you will look at the Virginia display at the Exhibit Hall. Then you will see what is being done. A moving picture has been made with scenes "before and after taking" that will be

shown during this meeting. All of you should see it.

I had the very great privilege personally of following Dr. Henry R. Carter through the swamps around Wilson, Va., and of supervising the one hundred per cent demonstration that was done there several years ago. The work elsewhere in Virginia has been and is being conducted along the same lines. We are emphasizing screening and education of the people because we think they bring the best and most lasting results. Then the other things necessary are done as opportunity and funds available permit. There were six or seven towns in which we worked averaging 90 per cent drainage and control. Smithfield, the town from which the famous Smithfield hams come, was one of the worst malaria-infected places in the State up till this year. Under our direction they completed a drainage project there to the general comfort of all the people and a marked reduction of malaria.

A Member.—How much has the State of Virginia appropriated?

Dr. Flannagan.—Six thousand five hundred dollars, which the International Health Board matches with an additional $6,500, and the United States Public Health Service adds the services and traveling expenses of a physician expert.

Dr. S. C. Beach, Illinois Central Railroad, Chicago, Ill.—I would like to say a word on this subject from the standpoint of the railroad. The Illinois Central, running through a portion of the malaria section of the United States, is tremendously interested in this subject. We have backed up this anti-malaria proposition not only financially but practically in work actually done. You of the South have no monopoly on malaria. We have a good working plant in southern Illinois. I refer to Carbondale and Herrin, in the southern part of the State. Last year we had some 456 cases of malaria in that neighborhood. Some of these cases originated from swamps near the Illinois Central shops. We shot some drainage ditches there with dynamite and the malaria incidence this year was something like 81 cases—quite a remarkable reduction.

All this has a secondary influence, which is very important. It is that the Illinois Central is getting more interested in this anti-malaria movement. This is the result of the efforts of the United States Public Health Service, the International Health Board and interior forces in the Illinois Central. Five or six of the states through which the Illinois Central Railroad runs are Southern states, and you can add southern Illinois to the states which have considerable malaria. We are going after this thing in what I think is the right way, in a cooperative way. Having started this movement, like any moving body we are gaining force as we go on, and we anticipate rendering visible, actual and practical assistance along these lines.

Dr. D. J. Williams, County Health Officer, Harrison County, Gulfport, Miss.—I am before you in an effort to answer some of the questions that have been asked and that seem to have been studiously dodged by the speakers who followed the questioners.

In my County (Harrison) we have about 546 square miles, with a 28-mile coast. In it is a relatively large area covered by swamps and marsh. We began the anti-malaria work in 1916, when it was largely educational. In January, 1918, we began the intensive work, selecting an area near the coast about a mile wide, which contains about two-thirds of the population of the County. It was estimated that the required amount of ditching in this area would be about 225 miles. We have already constructed about 215 miles. The cost of the construction, maintenance, oiling and other expenses incidental to the campaign has been approximately $121,000. We estimate that we are saving about $57,000 annually to our County, which has a population of about 38,000, with from 23,000 to 25,000 living within the area intensively worked. This $57,000 is saved to our people by the appropriation of $15,000 annually for the County Health Department.

In the beginning of our campaign we had an average of 1,540 cases annually. Last year we had 112 cases, more than twelve of which we know definitely came from outside of the County. We think that in Harrison County, so far as our individual County is concerned, we could approximate one hundred per cent reduction in malaria if we could control the introduction of the disease from outside from this time on.

It is our idea that the county-wide work can best be started in a limited area, letting the lessons taught in that way spread throughout the county. If that is so in one county, it will hold true for a group of counties. We believe this, because we have had a reduction in the unworked area corresponding to that in the area which we have intensively worked.

As to screening, while some have stressed screening, I want to say to you that where you have "Bohunks" and practically every other race represented you will not get anywhere with screening. If you have the right kind of people, you may do effective screening.

In the beginning I had a great deal of misgiving about attempting to sterilize the malaria carriers, but the more work I do along this line the more I am convinced of its value. As you approach one hundred per cent control, you will have to sterilize the carriers. We did not get far with sterilization at first. I was not very enthusiastic over it, but I am willing to see anything tried in malaria. When we reduced our cases down to 750 we began to sterilize the carriers, and when the number dropped to 400 we began to index them. Then we reduced the number to 250; and when we had them all indexed and knew the conditions in the homes, we began to get a pretty good grasp on our malaria problems.

If you can show any organization, your board of supervisors, luncheon clubs, chamber of commerce, etc., in a highly malarial district that you can save your county $57,000 a year, it will appeal to them, and you will have a basis for getting an appropriation for health work.

Dr. L. D. Fricks, Surgeon, United States Public Health Service, Memphis, Tenn.—I find my-

self in accord with Dr. Leathers' statements relative to the importance of education in malaria control. I believe that the coordination of malaria control with other rural health work in the South, and education of the rural population, especially the younger population, are the important elements in the malaria control situation.

I am not in entire accord with Dr. Leathers' statement that we probably in the past have not appreciated the importance of educational efforts. To my mind, although we may not have appreciated the importance of education, all the work that has been done in malarial control in the past four or five years—all the work worth while—has been so because of its educational value. The direct effect—the reduction of the number of cases by one hundred here, five hundred there, or perhaps a thousand in another area—I think is insignificant when we consider the amount of malaria in the South. But the educational effect is of great value and the education of ourselves is valuable, too. We are getting nearer all the time to the realization of the fact that different methods of control must be applied in different localities. We have our principles, yes, but no fixed rule that must apply to every community. Within a few years I believe that we can reasonably hope to look for great relief in the malaria situation in the South through the coordination of malaria control with other rural health work and the education of the people who are vitally concerned.

Dr. William Krauss, Memphis, Tenn.—Reference has been made to the problem of malaria control in counties that are not self-supporting. Why are they not self-supporting?

Several years ago I was connected with the State Board of Health of Tennessee as a member. There was an outbreak of smallpox in Maury County, which the County had for a year been attempting to handle. Neighboring counties made protest and the State Board of Health finally took it up and cleaned the situation up. When the work was finished it was found that there was no one to pay the bill.

For contrast, Shelby County, in which Memphis is located, in 1922 paid $372,765.54 in State automobile tax, of which it gets back about $6,000. If it is possible for the State to collect that amount for the highway fund, why can it not do the same for health work?

Dr. T. H. D. Griffitts, United States Public Health Service, Mobile, Ala.—It is important to have on file in the state health department as complete a health record of every community as possible, so that if the question ever comes up about malaria in the state anywhere the state health officer may have at his finger tips information that may be readily applicable to the correction of conditions. I believe in surveys and the recording of them. At the time they are made it may seem that the data collected are of little value, and yet they may be a strong fortification put into action at any time.

As to making "malaria drainage" subsidiary to agricultural drainage and regarding it only as an economic question, let us be careful. We are health workers. Our problems are health problems; our functions health functions. Let us regard malaria prevention primarily as health work, and agricultural development often a very valuable by-product of health work. And, by the same token, good health frequently is a by-product of drainage for agriculture. We are not economists; we are not agriculturists. However, we should be prepared to offer scientific assistance in the health phases of any development.

As to screening, I believe that in Virginia and in a great many other states, or sections of states, screening must stand second only to drainage, inasmuch as screening is an important protection also against other diseases in which the board of health may be as much concerned as with malaria.

Dr. Welch mentioned the apparent prevention of dengue as a result of malaria control work. If I may quote Howard: "Culex fatigans (quinquefasciatus) is the common barrel-breeder of the South." If we are doing strictly anti-anopheline work, as was done at Mobile this year, no attention is paid to fatigans, stegomyia, etc. By anti-anopheline measures solely we should not expect a noticeable influence on dengue. The breeding habits of our malaria vectors are quite distinct from those of fatigans and stegomyia (both of which, it seems, may be dengue carriers), and any efforts to apply to dengue prevention must cover artificial container production. No doubt Dr. Welch referred only to those places doing "general mosquito destruction," as some places are doing.

Dr. Welch.—I want to say, in reply to Dr. Griffitts, that in Brewton, Ala., and in Eufaula and other places we have controlled dengue fever. Mosquito control was so well carried out in Dothan, especially, and in Brewton (where at one time the pestiferous mosquitoes were so bad that you could not sleep in the hotels, even though they were screened, but traveling men have written me that they can now sleep there comfortably), that those towns did not have any dengue fever. It was present in every other town in the State, and I believe I am justified in saying that the anti-malaria work did control dengue fever.

When we go into a county we go to the worst sections of that county. Each farmer that undertakes the drainage of his land is called a project. The ditching consists of clearing, of cleaning a ditch, in opening an old ditch, and in digging a new ditch. In reporting that, according to the rules of the United States Public Health Service and the International Health Board, we report the progress of cleaning, of clearing, of opening old ditches and of cutting new ditches. When we finish that project it is one hundred per cent. We have never said that we had one hundred per cent in a county. It is the projects we are reporting on and not the county as a whole.

I do not know what legerdemain they practiced in South Carolina to bring about the reduction in malaria there. It did not just happen so in Alabama.

Dr. James A. Hayne, State Health Officer, Columbia, S. C.—The legerdemain was done by the

United States Census Bureau, which cannot accomplish anything in Alabama, as you are not in the Registration Area.

Dr. Welch.—The educational methods which we have used in Alabama have been screening, which extends to all parts of the State, and the introduction of top minnows. I must differ with Dr. Leathers in his estimation of the value of the top minnow as a controlling element in malaria, for I do not think that it can be overestimated.

Dr. Rose, in going over Alabama some time ago, noticed the amount of screening that had been accomplished in the rural districts, and was disposed to credit the fall in malaria to the amount of screening that had been done. Now, I do not want to underemphasize the value of other measures, but I believe the fall in the incidence of malaria is due largely to education.

We have had the Carter "Primer" in the schools now for three years, and it is a part of the school curriculum. I am sure that the high school boys who have learned the Carter "Primer" have been the greatest allies we have had in this campaign.

We have not neglected the use of quinin. I am very sorry that Dr. Maxcy did not report some of his observations in an impounded water region in Alabama, where out of 198 persons in the area 167 had malaria. It slipped up on us. Probably we should have known about it, but we did not until it was under full swing. The only thing to do was to send a man from house to house with the standard quinin treatment. Three families left off the quinin treatment after three weeks, and they were the only ones that had any relapses. They began taking quinin again and have had no more chills.

Speaking of county organization, we do not start a county organization in Alabama with less than $7,500. When we get the county health department started, the engineer is assigned to the county health office.

We do not put up any more money at all. The work is done through the county unit. In counties that are not organized the work is done through the State organization. Out of those organized counties in which work was done we have already had two counties to organize, and another has voted an appropriation, which has not yet been made available.

Speaking of the organization in Texas, I do not believe that it is possible to do any permanent health work by spasmodic effort. Public health work is a business, and until you have a business organization that appeals to the appropriating power as an organization that will function, you will not get anywhere. You are going to waste your money. When you get untrained people, in a moment of enthusiasm after an epidemic of dengue fever or some other epidemic has passed over, to go to the legislature and get the money and go out and spend it, then when you go back again for money you will not get it. You will not do anything permanent that you can stand on until you get a business organization. I believe that all public health work should be preceded by a business organization. I mean by that I believe you should have a sufficient personnel so that when you have done drainage and work of that kind you will have an inspector who will follow up the work next year and see that it is carried on. We have a contract that the municipality will furnish money enough for the inspector to come back the next year after and see that it is carried on.

Dr. W. S. Leathers, Chairman.—I would like for Dr. Welch to answer more definitely the question which has been raised by one of the speakers as to whether the reduction of malaria is due to the methods that have been used or is it simply decreasing naturally. It has been my belief that the methods employed have been educational and have had a generally educational effect upon the people in the control of the disease.

Dr. Welch (closing).—I thought that I answered that when I said that the methods used, the oiling, ditching and quininization, had brought about the results in Alabama. The first step was the demonstration by the United States Public Health Service in Montgomery, Anniston and Muscle Shoals. From that demonstration spread the knowledge that by ditching, by oiling and by the distribution of minnows in all the waters of Alabama this particular piece of health work could be accomplished. I do not know whether or not it spread to the rural districts of South Carolina, but I understood that similar work had been done there. Possibly they did not know about it, but I understood that work similar to that done in Alabama had been done there, but it may have escaped notice.

There is no question in my mind that educational methods—we are simply in the experimental period, although we are doing permanent work in drainage and screening—have been responsible for the reduction of malaria in Alabama, which has been spectacular. I see no reason why, if you locate the carriers in the spring and give them the standard treatment (we are doing that now in some counties where we have impounded water—watch for the first man who has a chill in the spring and give him the quinin treatment, and see that no mosquitoes get to him), I do not see why you cannot handle malaria by that business method just as you handle other diseases. If you learn where the first focus of infection is and stamp that out, you do not get the infection.

Dr. Hayne.—I rise to a point of personal privilege. I want to state that I was working on the Isthmus of Panama when the real malaria control work was done there and I spread that knowledge to my own State. The first real malaria control work in the United States was done in Hartsville, S. C.

METHODS FOR DETERMINING MALARIA PREVALENCE—THE SPLEEN RATE OF SCHOOL BOYS*†

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Everyone admits the desirability of "good malaria statistics." Everyone who has had to deal practically with the problem admits the difficulties peculiar to the collection of accurate figures on the prevalence of this disease. Many methods of collection have been devised. All yield information; and all have errors of more or less magnitude. Briefly, the more important and commonly used methods may be grouped under four heads:

A. History Index.—Physicians' cases or calls, house-to-house canvass, mortality and morbidity reports, insurance claims, sale of quinin and chill tonic, and opinion of intelligent laymen, etc.

B. Spleen Index.

C. Parasite Index.

D. Anopheline Index.

Of these, the spleen index has been but little used in this Country. Tropical workers regard it as the best single measure of malaria prevalence. Sir Ronal Ross[1] makes the statement that "the spleen index should be a nearly correct measure of the true malaria rate," but makes the following reservation: "Quinin, local conditions and other diseases (especially kala-azar) may affect the spleen index, but in most countries only to a small extent."

In this Country, Derivaux, Taylor, and Haas,[2] in 1917, examined 141 children near Lake Village, Ark. (April and May) and found only 4 enlarged spleens, whereas the parasite index on the same group was 17 per cent. They concluded that the spleen index in no way represented the true endemic index of malaria in that section.

In 1921, Dr. Barber and Dr. Coogle[3] examined 1261 boys in Mitchell County, Georgia. Of this number only 2.1 per cent showed palpable spleens. In three schools where a parasite rate of 5.5 per cent was found the spleen rate was 5 per cent. These examinations were made in February, a time of year when the findings would be expected to yield minimum figures. They were repeated on this same group of boys in Mitchell County and on the boys in a few schools in the counties surrounding, in September and October of the same year,[4] a time when findings would be expected to be at a maximum. Eleven hundred and eighty-one boys in Mitchell County showed a spleen rate of 1.3 per cent, while blood smears taken on 318 of the same school children showed 4.7 per cent positive. In 10 schools located in surrounding counties, 480 boys showed a spleen rate of 3.4 per cent and of 119 blood smears taken from both sexes, 9.2 per cent were positive. In this section it was again evident that the spleen examinations did not yield a significantly large figure and did not give a fair index of the amount of latent malaria.

However, there are certain obvious advantages in the spleen index which seemed to render further observations in other sections of the Country desirable. It is an objective method. There is little or no error of interpretation in skilled hands. It can be rapidly and easily applied to large numbers. The error due to sampling can be made quite small and readily calculated. It is practically as certain an indication of malaria, past or present, in an individual as the finding of parasites in the peripheral blood. If it could be used alone or in combination with a history index or parasite index, or both, as a yard stick by which to measure or indicate the amount of endemic malaria, it would help us to solve the problem of expressing more accurately the degree of prevalence of this disease over large areas and of gauging the effectiveness of control measures.

The results here reported are, therefore, a continuation of the work started by Barber and Coogle in south Georgia in an ef-

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fort to delimit more carefully the extent to which spleen examinations are of value in this Country.

METHOD

The method of spleen examination was similar to that recommended by Ross, Christophers and Perry[5] and the same as that employed by Barber and Coogle[3] in their south Georgia work. The boys were examined in the standing position. They were instructed to lean forward slightly, to relax the abdominal muscles and to breathe deeply. The examiner slipped his hand under the loosened clothing next to the bare skin and palpated in the left upper quadrant under the costal margin. When a definite spleen edge could be felt, descending on inspiration, the case was recorded as positive. The degree of enlargement was roughly indicated as "palpable," "palpable one," "palpable two," and "palpable three or more fingers' breadth below the costal margin."

Whenever there was any doubt in the mind of the examiner about the result in an individual case, the boy was re-examined in both the standing and the reclining posture with abdominal wall thoroughly relaxed.

The authors worked together on a large number of boys to check each other and thus obtain uniformity in results. No attempt was made to detect slight enlargement of the spleen by percussion. This is too uncertain under field conditions. Only definitely palpable spleens were recorded as positive.

At the time of the spleen examination each boy was questioned individually as to whether he had had definite "chills and fever" of the every day type or the every other day type during the preceding year. The answers were classed as simply positive or negative history and formed the basis of the "history index."

Blood smears were then taken from a large percentage of the boys present and sent to the laboratory. Here a certain number were selected at random (representing about one-third of the total number of boys examined) stained and examined with thin smear technic. The resulting "parasite index" is, therefore, based upon a true random sample of the whole group measured.

Some objection may be offered to the fact that these indices are based only upon boys of school age and do not represent the population at large—all ages, both sexes. However, it must be borne in mind that it is impossible to measure the absolute amount of malaria in any population. It is practicable only to determine the relative amount in a sample population group and to use a similar sample for comparison in other areas or in the same area in other years. Instead of using a small sample of the population at large, as is usually done, these examinations were confined to a definite group of the population, and it must be borne in mind that the resulting figures are an *index* in the true sense of the word and by no means a direct measure of the amount of malaria.

Where reference is made to the mortality rate from malaria in the several counties in which examinations were conducted, this rate has been calculated upon the basis of the average number of deaths per 10,000 population for the past three years—1919, 1920 and 1921. On account of the small numbers concerned this gives a better value than a rate based on a single year.

RESULTS

It seemed desirable to select an area for study in which there existed a high malaria incidence. The southeast Missouri lowlands seemed to fill the requirements in this respect and opportunity was presented to make the first observations here. The country is low-lying, flat, Mississippi River bottom land, the topography of which is broken here and there by low ridges. It is bounded on the east by the Mississippi River and on the west by the tortuous, winding course of the St. Francis, the center being taken up by the Little River overflow. Twenty years ago, except for the settlements along the ridges, much of the country was a great wooded swamp, large areas having been completely under water during the flood season. Today thousands of acres have been drained, cleared and protected from overflow. This reclamation has left one of the richest agricultural sections in the world. Formerly a hot-bed of "swamp fever," "black water fevers," "yellow chills"

(every variety of malaria in its most pernicious forms), this disease still prevails to a considerable extent and is a serious economic problem in many areas.

In these lowlands 76 schools were visited, practically all of which were of the small rural type. A total of 2330 boys were examined. Out of the group, 179 boys were found to have definitely palpable spleens—a crude spleen rate of 7.7 per cent. The high rates were found in the counties farthest south and next to the Arkansas line, namely, Dunklin and Pemiscot with rates of 9.4 and 7.9 per cent, respectively. The largest number of boys with palpable spleens found in any one school was at Beech Corner School in Dunklin County, where 20 out of 75 boys were positive.

RELATION OF POSITIVE HISTORY TO PALPABLE SPLEEN

Of the whole group of boys examined 36 per cent gave positive histories; and of the boys with palpable spleens, about 58 per cent. In this connection it must be borne in mind that an enlarged spleen may represent:

(a) A residual from an inadequately treated acute case.

(b) A "scar" of repeated acute attacks.

(c) Evidence of chronic infection, perhaps contracted during the preceding season and at present dormant or asymptomatic.

Leaving out of account the error due to memory defect on the part of the school child, or his incompetence to answer correctly due to immaturity or low intelligence, many cases of negative history would be explained under (c).

In one or two schools where palpable spleens were found the history rate was less than 10 per cent, which borders on the negligible. As a general rule, however, the history of attacks of malaria during the preceding season indicated that a corresponding spleen rate would be found. The facts are graphically presented in a correlation table (Table I). The coefficient of correlation for the whole table is 0.411 (p. e. 0.005). This table is based upon only 101 schools. The individual groups are small and there is a considerable variation due to chance; but, in a general way, it would seem to demonstrate that a significant spleen rate is not apt to be found unless at least 23 per cent of the boys give a history of malaria during the preceding season, and the higher the history rate the more apt one is to find palpable spleens.

TABLE I—Showing Correlation Between Per Cent Positive History and Per Cent Palpable Spleen in 101 Schools Examined in Missouri, Kentucky, Alabama.

Per cent with Palpable Spleens	Per Cent Giving History of Malaria During Preceding Year								
	0-10	11-20	21-30	31-40	41-50	51-60	61+	Total	Mean Per Cent Positive Histories
0- 2	10	7	10	4	5	1	1	38	23.4
3- 5	1	3	4	3	1	1	1	14	30.0
6- 8	1	2	2	5	1	2	0	13	31.9
9-11	0	0	5	3	0	1	2	11	37.7
12-14	0	2	1	0	2	3	1	9	41.7
15-17	0	0	1	0	1	0	2	4	50.0
18-20	0	0	0	0	1	0	1	2	55.0
21+	1	1	0	2	4	1	1	10	39.0
Total	13	15	23	17	15	9	9	101	31.8
Mean per cent Palpable Spleens	3.3	4.8	5.2	7.4	10.3	10.0	10.8		7.3

In this same area, the Missouri lowlands, it was possible to compare the spleen rate of school boys with the history index of the whole population, obtained by house-to-house canvass. Nineteen schools were visited and examined in the area about Sikeston, which had been intensively studied by Dr. Mark Boyd, I.H.B., and Dr. Mark Ziegler, U.S.P.H.S., during the fall of 1921.[5]

The history index obtained by a house-to-house canvass of the whole area, 4506 persons, showed about 15 per cent of the population had had malaria during the summer of 1921. The crude spleen rate on 447 school boys drawn from the same area was 4.7 per cent.

To analyze the data a little more carefully, the area, which was 36 miles long and 12 miles wide, was divided into four zones, and each zone divided into a north and south half. The house-to-house canvass in the former was conducted by Observer A, and in the latter by Observer B. The resulting history indices are shown in Table II and compared with them are the spleen rates obtained from the school boys in the same zones. It is seen that

the variation in history rate indicated by the house-to-house canvass in the different zones is accompanied by a similar variation in the spleen rate. The time and expense required to obtain the history rate was infinitely greater than that required for a spleen index of the school boys.

TABLE II—Showing a Comparison of the Spleen Rate of School Boys with a History Index Obtained by House Canvass of the Same Population in the Sikeston Area of Southeast Missouri, 1921.

Area	History Index Obtained by House Canvass		Spleen Index
	Observer A 2570 Persons	Observer B 1936 Persons	Observer C 447 Boys in 19 Schools
Zone 1	31%	25%*	9%
Zone 2	10	7**	6
Zone 3	9	2	4
Zone 4	6	....	1
Total area	11.6***	14.7****	4.3

*Based on cases occurring up to September 15.

**Based on cases occurring up to October 15.

***Based on cases occurring up to time of canvass in August, September, October, November.

****Based on cases occurring up to time of canvass in August, September, October, November.

RELATION OF POSITIVE BLOOD SMEARS TO PALPABLE SPLEENS

The examination of 997 blood smears taken at random from 2330 boys in the schools of southeast Missouri showed a parasite rate of 4.5 per cent; of 138 smears from the 178 boys with palpable spleens, 28, or 20 per cent, were positive. Almost all were estivo-autumnal, but owing to the fact that the smears were taken in the late fall or winter, no conclusion is justifiable as to the association of this particular species of parasite with enlarged spleens. Failure to demonstrate the parasite in a single smear from many of the boys with palpable spleens is due to several factors—the scarcity of parasites in the peripheral blood, the fact that many are taking "chill tonic" or quinin at the time of the examination, and the fact that many are really cured of their infections, but exhibit the enlarged spleen as a "scar" of former battles. In other words, the spleen examinations revealed, in addition to those carrying parasites in their peripheral blood, many dormant or latent cases, and individuals who had suffered from repeated attacks.

Looking at the relation from the other point of view, of the 997 smears examined 58 were found positive. Of these 58 boys found to have parasites in their peripheral blood on a single examination, 29, or exactly 50 per cent, were found to have a palpable spleen by an entirely independent observation. In other words, one-half of the boys who had positive smears were picked up by spleen examinations.

On account of the small numbers it is not worth while to attempt to correlate the blood findings of a single school with the spleen findings in the same school. On the other hand, it is noteworthy that where a group of schools are considered together as in Table III, the spleen rate in this particular section shows a higher figure than the parasite rate, but there is no constant relation between the two.

AGE DISTRIBUTION OF PALPABLE SPLEENS

In the accompanying graph is shown the age distribution of the boys with palpable spleens, based upon the examinations made in southeast Missouri. It will be noted that the curve reaches its high point at the age of 9 years and thereafter declines, showing a sharp drop about the time of puberty. Among several hundred boys examined from the age of 16 on, no palpable spleens have been felt. Although this may be partly due to the greater difficulty of feeling an enlarged spleen through the developed abdominal wall and thick rectus muscle, it can by no means explain all. The enlarged spleen due to malaria in this Country is evidently much more commonly found in children than in adults.

RESULTS OF SPLEEN EXAMINATIONS IN OTHER AREAS

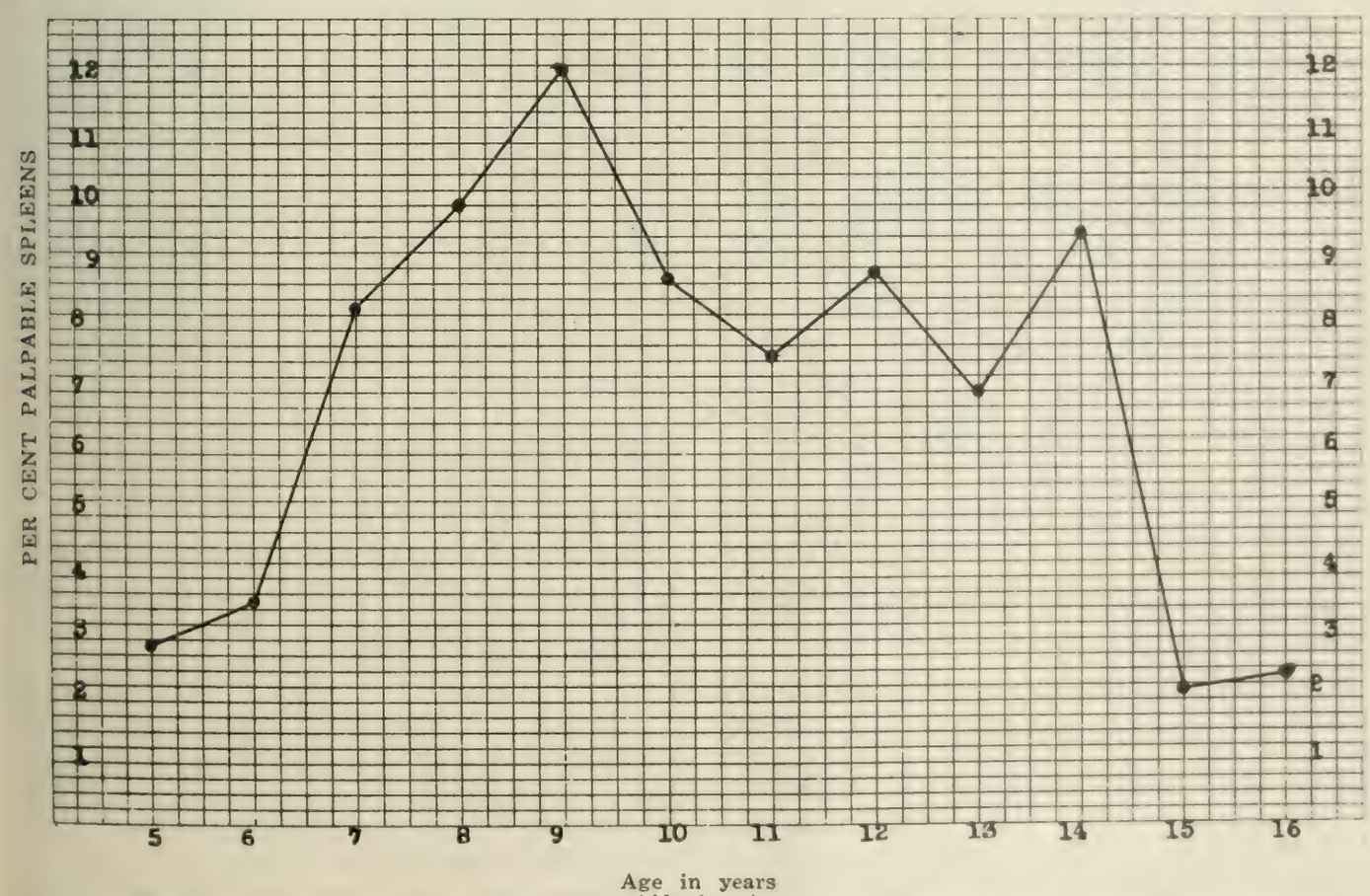
A summary of the results of these examinations conducted in southeast Missouri is shown in Table III. It is to be noted that in this particular section the spleen rate was large enough to be of value as an index to the amount of malaria present. Indeed, it yielded a figure appreciably larger than that given by the very much more laborious and costly method of blood smear examinations, and equally as valuable.

Since favorable results with the spleen examinations were obtained in this area,

an effort has been made to control and extend the observations in other areas (see Table III). In the first place, as a negative control, a "hill" county of Missouri known to have little or no malaria was visited and 84 boys in four schools examined. No enlarged spleens were found, and the absence of a significant history rate and of parasites in the smears examined confirmed the spleen findings.

TABLE III—Summary of the Results of Spleen Examinations of School Boys in Southeast Missouri, Compared with Similar Examinations in Other Sections.

State	County or Area	No. of Schools	No. of Boys Examined	Per Cent with Positive History	Per Cent with Palpable Spleen	No. of Blood Smears Examined	Per Cent Positive for Parasites	Month—1921-22
	Pemiscot	28	929	39%	9.4%	362	2.5%	Dec.
S. E. Missouri	Dunklin	27	890	30*	7.9	395	7.3	Nov.
(lowland)	Sikeston	19	447	37	4.3	183	3.8	Jan.
	Cape G.	2	64	56	4.7	57	0.0	Feb.
		76	2330	36%	7.7%	997	4.5%	
Missouri (highland)	St. Francois	4	84	5%	0.0%	21	0.0%	Feb.
Kentucky	Fulton	9	363	15%	4.4%	176	0.0%	Mch.
Southern	Jackson	6	305	15%	1.8%	143	0.0%	Mch.
Illinois	Alexander	11	609	26	0.8	124	0.0	
		17	914	23%	1.1%	267	0.0%	
Alabama	Houston	15	235	32%	4.3%	98	2.1%	May
	Escambia	28	532	....	1.3	390	1.0%	May



Graph No. 1.—Age distribution of boys with palpable sp leens, expressed as per cent of total of each age examined.

In other words, where malaria is absent an enlarged spleen in a school boy, due to other causes, is a rare finding.

Fulton County, in Kentucky, without doubt has the highest malaria prevalence of any county in that State and, judging from the death certificates, the malaria problem would be classed as a severe one. Only about 15 per cent of the boys examined stated that they had had an attack of "chills and fever" during the preceding season. With this low history rate, it was not surprising that only 4.4 per cent showed enlarged spleens. The figure proved again, however, to be of more significance than that obtained from the examination of 176 blood smears.

In southern Illinois, examinations were conducted in two counties—Jackson and Alexander. These counties are known to have foci of malaria, but their mortality reports do not indicate a severe problem. Despite the fact that 23 per cent of the boys gave positive histories, only about 1 per cent were found to have palpable spleens. Here the spleen rate is obviously too low to be of definite value. There may be a considerable error in the history rate in this instance, or this may be a section in which enlarged spleens are not found, although the disease prevails quite widely.

In Alabama, two typical counties were studied. The first was Houston County, which is known to have the highest malaria prevalence of any county in this State. Fifteen schools with 235 boys were examined in May of this year. About one-third of the boys gave histories of malaria last season. Four and three-tenths per cent showed palpable spleens. Ninety-eight blood smears examined showed 2 positives. In Escambia County, where malaria is known to be only a small problem, this fact was indicated by the low spleen rate, 1.3 per cent, as well as the parasite rate taken by Dr. Barber, which was 1.0 per cent.

Besides the observations recorded above upon large numbers of school boys, many more or less isolated schools have been visited in other counties in Alabama. Many children have also been examined in their homes. In general, these observations have tended to confirm the statement that in Alabama, where a serious malaria problem is present, one seldom fails to find evidence of the fact in enlarged spleens.

RESUME

In defining the field of usefulness of the spleen rate as a measure of malaria prevalence in the United States, there are two questions raised:

(1) Is the spleen rate a definite measure of the amount of endemic or chronic malaria in a locality?

(2) Is the spleen rate a figure sufficiently large to be of significance as an index of prevalence?

Concerning the first, the observations here recorded involve small numbers and are derived only from southeast Missouri in the late fall and winter. One-half of the boys in whose peripheral blood parasites were demonstrated, had enlarged spleens. Looking at the matter from this point of view, the spleen rate indicated just one-half of the actual malaria known to be present. On the other hand, of the boys with palpable spleens only 20 per cent were shown to be positive by a single blood smear. If every boy, or even most of these boys, were potential carriers of malaria infection, the examination of blood smears revealed only about one-fifth of the actual chronic malaria. The balance in this case seems to be on the side of the spleen rate. It would seem justifiable to conclude that under the conditions of examination in this particular area of the United States, the spleen rate was more nearly a measure of the endemic malaria among the school boys than was the parasite rate. That this does not hold true for all sections is indicated by the previous work to which reference has been made. Even at best the value is only relative and not absolute.

As to the second question, so far as recorded observations go, it is evident that in some areas, at least, the spleen rate among boys of school age *does* yield a figure sufficiently large to be of value as an index. It does not hold true for all sections. A high spleen rate may be lacking where malaria is known to be highly prevalent. Positive findings are of more value than negative.

There are many reasons for this variation. It is commonly accepted that the

administration of quinin has a considerable influence in preventing enlargement of the spleen. Accordingly, wherever the population is intelligent and receives good medical care, the spleen rate would probably be low; on the contrary, where there is ignorance, superstition and neglect and self-medication with inadequate "chill tonics," the spleen rate would be high. Again, the enlarged spleen is to some extent a measure of chronic or repeated attacks of malaria. A higher rate would be expected in a region where malaria prevails continuously year after year than in a section, previously almost free of the disease, suddenly attacked by an epidemic—such as so often occurs after the impounding of a water supply.

These same changing local conditions would cause the spleen rate to vary independently of the history and parasite rate. Local conditions and the large error of interpretation considerably affect the history rate by itself. The parasite rate varies with the season of the year, the technic of the examination, the size of the sample, and other factors. It is not to be expected that a constant ratio can be established between the spleen rate and the history rate on the one hand, or the spleen rate and the parasite rate on the other.

It also seems clear that in those areas of this country where there is a low incidence of malaria—where it is scattered about in small foci, as is the case in so many counties in the Southern states—the spleen rate of school boys will not be sufficiently large to be of significance. The method must, therefore, be limited to those areas where there is a large endemic malaria problem affecting the greater part of the population. In a later study an attempt will be made to indicate what counties in the several states have such a problem. Even in these areas of high prevalence in this Country it seems unlikely that there will be found spleen rates based on a large number of children as high as 20 to 30 per cent or more such as are commonly reported from tropical countries.

In the meantime, as a useful working hypothesis, experience shows that it is usually not worth while to examine the boys of a school for enlarged spleen unless 25 per cent or more give a history of "chills and fever" during the preceding season.

CONCLUSION

In certain areas of high malaria prevalence in the United States, the spleen rate of school boys is a satisfactory index of this disease.

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DISCUSSION

Dr. John A. Ferrell, International Health Board, New York, N. Y.—The determination of the prevalence of malaria, and its public health importance, are outstanding problems confronting public health administrators. Several methods for obtaining the malaria index of a community have been tried. They have been founded upon the anopheline density and the clinical manifestations of malaria, including personal histories, physicians' records, blood examinations, and spleen examinations. Spleen examinations have hitherto been used in tropical countries more than in the United States. If Dr. Maxcy and his associates can demonstrate that under our climatic conditions the spleen index is a reliable means for determining the incidence and importance of malaria, and that it can be economically employed, they will have made a most valuable contribution.

We cannot over-estimate the importance of having an accurate measuring rod for the amount of malaria in a community. The legislative bodies wish to know specifically the importance of the disease before appropriating money for its control, and they wish to know also whether or not expenditures made actually produce results. Moreover, it is important for the public health authorities to know whether or not the incidence of malaria in given communities is increasing or diminishing. Most of this information cannot be accurately collected unless we have at our disposal a practicable method for obtaining the malaria index.

I wish to express the hope that others who are in a position to do so, will conduct similar studies, so that those of us who are engaged in the administrative side of public health work may have at our disposal the guidance we so greatly need.

Dr. C. C. Bass, New Orleans, La.—The choice of methods for determining the prevalence of malaria depends very largely, it seems to me, upon the purpose we have in mind. If, for instance, we wish to learn whether malaria prevails in a community, without any special object of knowing to what extent it prevails, or

without any great degree of accuracy, we need not go to great pains to do so. If, on the other hand, we wish to know the total amount of malaria in a community, we have a very difficult (in fact, an impossible) job. There is no method or combination of methods by which we can go to a community and determine exactly how many people in that community have malaria. Blood examination fails to find all of the cases; the history fails to point out all of them; the history of attacks, as given by physicians, also fails; and spleen examination fails. We cannot, at present, find out the total number of persons who have malaria in any given group of people. Whatever we do is relative, and has only relative value, and the advantage of employing any particular method depends largely upon our purpose.

The question is, what application or use are we going to make of the results of our survey? If, for instance, we expect to sanitate an area, dealing entirely with questions of sanitation, it does not seem to me that it should be necessary to find all of the people in that area who have malaria. All we want to know is that there is a sufficient amount of malaria in the community to justify the effort and expenditure that will be required to control or reduce it.

If, on the other hand, we should include in the work to be done the treatment or cure of those who have malaria, we wish to find every case that we can. We then have to choose between three sources of information: history, blood examination, and spleen examination.

I believe it is the consensus of opinion, a generally accepted fact, that the spleen rate is not so high as the parasite rate or the history rate. Where we find one enlarged spleen we may find a variable but considerably larger number of positive bloods or positive histories.

One thing that should be said relative to the value of the spleen rate is that its reliability depends very largely upon the expertness of the examiner. Although those who are accustomed to making these spleen examinations become very expert and recognize an enlarged spleen without any difficulty, those who have not become so expert are unable to make anything like so reliable a survey. The same thing, however, can be said with regard to history taking. If several different ones of us should make a survey of a community and take the histories, there would be considerable difference in our records of positive histories. One would perhaps be more expert in recognizing the correctness of histories and possibly others less so. The intelligence of the people would also have a great deal to do with it.

The same thing applies to laboratory examinations. Not only must the examination be made, but it must be made by one who is expert, one who is competent to recognize the parasites and who is not likely to make the errors commonly made. Unfortunately, the examination of blood for malaria parasites is a difficult thing, and it requires a great deal of experience and practice in order to do it reliably.

It is my opinion that if we wish to determine the prevalence of malaria to the highest degree, we can do it best by expert or good history taking and by blood examinations. If, on the other hand, we wish to determine the prevalence of malaria in a general way, and where it is quite prevalent, we can do it perhaps as well by spleen examination, without the enormous expenditure of time and effort necessary in the other methods. If we are dealing with a region where malaria is less prevalent, and where it is mild in form, the spleen rate may be so low that it might not be so useful or so indicative as we might wish. On the other hand, in regions where the infection is heavy, it may be valuable.

In the spleen method we are also probably including a number of incorrect diagnoses. Malaria is not the only thing that causes enlargement of the spleen. That is not of great importance, however, because wherever malaria prevails to such an extent as to make us consider the spleen rate of value, it would so outnumber the other diseases that the errors in diagnosis would be negligible.

Mr. H. F. Ferguson, Sanitary Engineer, Springfield, Ill.—Illinois is in the elementary class in malaria control work, and I intended to sit here only as a listener and learner, and not make any remarks. But in the last paper some references were made to studies in southern Illinois, and Dr. Beach also referred to some work in southern Illinois.

Presumably you have all heard the expression, "Out where the West begins." Southern Illinois, where our malaria problem exists, may be considered the place where the South begins, or, if you are looking up the Mississippi, where the North begins.

We started this year, in Illinois, some malaria control work. Our time was limited before the work started, but we wished to obtain some figures of numbers of malaria cases to compare with future figures to show whether the work done during the 1922 season was worth while, and we obtained them by a house-to-house canvass. We shall make another survey at the end of the year.

If you obtain the number of cases by laboratory methods beforehand, and the number of cases by laboratory methods afterward, would you not obtain the same comparative results as by the history of cases from a house-to-house canvass? The history of cases was the quickest method by which we could get the information we wanted.

In order not to discourage some of the people who are working in the Southern states, I wish to call your attention to Dr. Beach's figures. He said that at Carbondale, Ill., malaria had been reduced from 456 to 31 cases. Apparently he has added the figures for 1920 and 1921 together to get the 456 cases and compared that figure to 31 for 1922. The Illinois Central Railroad makes speed, as you see. The correct figures from the house-to-house canvass in 1921 showed 267 cases, and our preliminary canvass in the first week in November showed 54 cases this year—in other words, one-fifth of the number that had prevailed the previous year. Possibly,

if our friends from Alabama and South Carolina had not been so keen on checking up each other, Dr. Beach would not have escaped so easily.

Our malaria control work has been possible only through the cooperation of the International Health Board, the United States Public Health Service, and the Lions' Club at Carbondale.

Referring to impounded waters for power purposes, is it intended to include power obtained from steam, in other words, boiler water? In Illinois we have not sufficient fall to our streams to produce water power, but we do have a large number of mines and factories that have water impounded for steam purposes, and these ponds are frequently mosquito breeders.

Dr. F. F. Russell, International Health Board, New York, N. Y.—Of course, it is foolish to go on making demonstrations after you have proved what you are trying to prove. It is now time to apply the knowledge gained. That is the second stage. The third stage is when the farmer is doing his own work and is cleaning up his own area. It seems to me that that is important enough to call it the third stage—when the people become interested enough to do their own cleaning up and anti-mosquito work. The state board of health has a direct interest in the larger projects, where the work is so extensive that no small community can do it, as when a state charters a drainage district.

There is one other thing I would like to say, which is brought up particularly by Dr. Maxcy's paper. That is, we are discussing in a general way two different things. We are discussing work on a broad scale for the prevention and control of malaria, and are, at the same time, discussing the very careful study of a limited area and a limited number of persons to find out exactly what the conditions are, with a view to using that knowledge in preparation for our wider control.

The preliminary measure is a careful, conscientious survey, and upon that you can go ahead and develop your larger plans. The first thing necessary is a careful survey, so that we can have accurate information, and only when we have that is it worth while to go ahead and do a big piece of work and spend a lot of money. If we are perfectly sound when we begin our work, we are bound to succeed. The work done by Dr. Maxcy is of interest. In different regions one has to use different methods, and in making a survey one can try the different methods until one finds the one most suitable.

Dr. Victor G. Heiser, International Health Board, New York, N. Y.—For the last three or four years I have had very little occasion to know much about malaria in the United States. My interest has been largely centered in foreign countries, but of course there are problems common to all countries.

The thing we find of the greatest difficulty is the method of arriving at conclusions, and if we continue studies in the direction of ascertaining more satisfactorily the true incidence of malaria it will simplify the problem very considerably. There are advocates of the method of depending upon doctors' calls, advocates of the parasite index, advocates of the spleen index, etc. Last year I attended a meeting in Java, during which one day was devoted to the question of how to make a proper spleen examination and the method to be used in recording the result. Some of the world's greatest authorities were there, but as no agreement could be reached the question was held over until another year. Therefore, it seems that if we can have more work of the kind done by Dr. Maxcy, it will be of great value.

Dr. M. A. Barber, U. S. Public Health Service, Brewton, Ala.—It seems to me an interesting fact that the spleen rate in the southern United States, even in localities where malaria is relatively abundant, is so low, as compared with rates we are accustomed to find in the tropics. The relatively low spleen rate in the southern United States is possibly due to a greater use of quinin, better living conditions, or to some similar cause tending to reduce malaria morbidity.

In our work we have found a house-to-house canvass useful in determining whether malaria is present to any great degree. All sick people, whatever the alleged disease, are sought out and blood specimens from them as well as from the healthy are examined for malaria parasites. The parasite rate thus obtained, while not, of course, representative of the whole population, is a useful index of the maximum rate obtaining at a given time. Possible yearly, as well as seasonal, variations must be taken into account whatever the method used in determining malaria prevalence.

Dr. Ennion G. Williams, State Health Officer, Richmond, Va.—So much has been said about the spleen index that I think it would be of value to have Dr. Bass tell us the other conditions in which the spleen is enlarged.

Dr. Bass.—Leukemias, anemias, Hodgkins' disease, typhoid fever, paratyphoid, etc.

Dr. L. D. Fricks, U. S. Public Health Service, Memphis, Tenn.—Is it not a fact that the diseases just mentioned can be easily differentiated from malaria by the average careful physician? Certainly, it seems to me, they should not be mistaken for malaria by a trained investigator who is making examinations for enlarged spleens due to malaria among school children in the Southern states. It is my understanding that kala azar is the one disease which the malaria writers stress as being easily confused with malaria, and, as we all know, kala azar is of extremely rare occurrence in the United States.

Dr. H. R. Carter, Assistant Surgeon-General, U.S.P.H.S., Washington, D. C.—What I do not know about the spleen index in America would fill a large volume. However, I must say this much. When we commenced, the reason why we tried to get an index for the measure of malaria was to determine the change in the amount of malaria as the result of control measures. We did not care to know how much malaria there was in 1913 in Roanoke Rapids, or in 1914, so long as our indices accurately showed the reduction. If our index showed only one-tenth of the malaria, but the same for each year, a comparison of the indices of the different years would give us an accurate knowledge of the diminution of malaria. In consultation with Dr. Rose and

von Ezdorf, in 1915, we accepted the number of physicians' calls as the index that we would take for the International Health Board work. The physicians' calls were to be counted the year they occurred. I understand recently that we have taken the physicians' remembrance of his calls, and that is a different thing. Our plan was to get them to keep an account of their calls this year and also next year, and to have our man take account of them every month.

The measures at that time available for determining the change of incidence of malaria were four: the spleen index, the blood index, the history index, and physicians' calls.

The small number of enlarged spleens found in proportion to infections—as determined by blood examinations—led us to reject the first, as any error in it would be too much magnified when it came to measure infections.

The blood index has the advantage (as has the splenic) of being independent of any errors on the part of the patient. Taken by the same man, with equal care and at the same time of the year, one blood index should be proportionately as accurate, or as erroneous, as another and the ratio between them should then accurately show the ratio between infections at the dates taken.

The history index is not considered accurate and yet two or more of them may be inaccurate near enough to the same degree for their comparison to give us a fairly decent idea of the change of the malaria incidence. This is not claiming a great deal. There is one thing to note and to discount in estimating its value. The history must be taken at the same time of year and cover the same number of past months. This will probably result in forgetting the same proportion of light attacks in both histories. If, as has happened, the first history is taken in the spring—when the work is begun—and the second in the late fall—when it is over—quite certainly a smaller proportion of these attacks, being more recent, will be forgotten in the second history than in the first and the reduction will appear less than has occurred. In general, reliability is thrown away if one history is made to cover more than one malaria season. Yet this has been done.

Why did we take physicians' calls as our comparative measure? As a measure, a measuring-rod, I mean, it confessedly varies more from the number of infections than the blood index. The same man may be seen in two attacks, or twice in the same attack if it be a severe one.

In 1915, we wanted to measure the good done, that is the injury averted, by anopheles control against the cost of such control, and also to use a yard stick that was not too costly to obtain. Obviously, in the measure of the injury caused by malaria one should consider not only the number of infections (blood) or of cases (history) of malaria, but the number of attacks as well and, as far as may be, their severity. Surely if a man has five attacks he is more injured than if he had one. If the attack be severe enough to call a physician, it is, presumably, more injurious than one in which a physician is not called. All three of these things, the number of infections (or of cases), of attacks and of the severity of the attacks, are factors in determining the number of physicians' calls. In addition, as originally planned, our agent getting the calls from the physicians' books each month, the data obtained was fairly accurate and not costly. Understand, I do not pretend that the physicians' calls take complete, or even fairly complete and comparative, cognizance of the factors making up the injury caused by malaria, yet they do take cognizance of them and thus it may be measure this injury as well as, or better than, would the spleen, blood, or history indices, and are certainly easier to obtain.

These last are obviously intended to compare the change in the number of individuals infected and do not pretend to take account of (1) the number of attacks per individual, or (2) the severity of such attacks, unless, indeed, numerous or severe attacks would be less apt to be forgotten in, and hence omitted from, the history indices.

This is the reason I urged this for a measure of the value of the work.

While no one would pretend that the number of physicians' calls is a measure of the malaria, yet, if you take the number before the anopheles work is done, and again after the anopheles work has been done, it will probably show approximately the amount of injury that has been averted. You can compare the amount of serious, injurious illness prior to the work and the amount of serious, injurious illness after the work.

If one wishes to get the best and most accurate comparative measures of the amount of malaria, I think the blood indices are the best. They do not give you all, but will probably miss the same proportion the first year as later. They are independent of errors of patients. The only objection is that they are costly.

While I think it may not be necessary to continue the physicians' visits index, I think at the time it was introduced it was the best index to the amount of injury that malaria was doing, and, therefore, the best estimate of the injury averted by anopheline control that we could devise.

Dr. Maxcy (closing).—A question was raised as to other conditions that cause enlarged spleen in this country. For our purposes, syphilis, tuberculosis and the splenic anemias are the conditions, besides malaria, which may give rise to enlarged spleen in children.

From our experience so far I think we can say that a spleen rate of not more than 1 per cent among school children is without significance. As it increases above 1 per cent, it becomes more and more useful as an indicator of malaria. When it is above 4 per cent, it is certainly useful for comparative purposes.

As to the question of the gentleman from Illinois relative to the value of a history rate obtained by house-to-house canvass, one has to bear in mind this fact: there is a large element of personal equation in any history rate depending

upon the individual asking the questions, the method of approach to the individual whom he is questioning, and the grade of intelligence of the population with whom he is dealing. If the same individual conducts the canvass in two successive years, using the same methods, the history index is of much more value than if a different individual had been employed each year. The greater the skill of the person in medical diagnosis, the more reliable the figure obtained will be.

As to the physicians' visits index, a recent experience is illuminative. When Dr. B. went to a certain town in Alabama to carry on research, he was told by the physicians practicing in that town that there was a great deal of malaria. He offered to examine blood smears taken from patients suspected of having malaria. Between January and August about 135 slides on such suspected cases were examined. Only about 6 per cent were positive after very careful examination of thick smear preparations. Now, Dr. B. was educating those physicians. They found that a good many of the cases they had been calling malaria were not malaria. Next year the number of visits which these physicians will charge up to malaria will be considerably smaller than that. If this is the index of control, it will show a remarkable drop, due to education. There are other errors which may be very annoying in using this index which need not be touched upon here.

Dr. Griffitts.—Did you use thick or thin smears?

Dr. Maxcy.—A thick smear was made on one end of the slide and a thin one on the other for the work in Missouri. Later, for the work in Kentucky and Illinois, a "drag" smear was used, essentially a thick smear technic.

"MAN-MADE" MALARIA*

By H. R. Carter, M.D.,
Assistant Surgeon-General, U. S. Public Health Service,
Washington, D. C.

Early in the work for the control of malaria our methods were entirely for removing such malaria-producing conditions as already existed. Very soon after that I saw that it was of very considerable, though not of so much importance, perhaps, to prevent the making of other conditions which would produce the anopheles and malaria. I found that there were quite a number of projects carried on for commercial improvement which were immediately producing malaria in malarial districts, the building of highways, the building of railroads, the impounding of water for power, either for power direct or for hydro-electric power, etc. They were making a good deal of what Dr. Fricks has called "man-made" malaria.

In the beginning of 1919, LePrince and I got the head man in Washington in charge of the good roads movement to put in certain specifications for the making of roads so that they would not make malaria. I have seen in Virginia, in Arkansas, and in other states roads that cost $5,000 and that would produce at least $1,500 worth of malaria. In 1919, specifications were put in which would prevent that, and which would make them put in culverts low enough; prevent leaving undrained borrow pits, etc. The specifications are all right, but they are not carried out. I understand that the same thing has occurred in North Carolina and in Arkansas.

LePrince and I took up the matter with the railroads during the War. We could do nothing with them when under private management. When they were handled by the Government, with McAdoo as supervisor, they agreed to the same specifications for new work. Whether or not they are carrying them out now I do not know. They did at Camp Meade and around the Quartermaster's Terminal and the naval base at Hampton Roads during the War. They did good and non-expensive work at both places.

As to drainage projects, some of you may remember the drainage done for Newport News. You would have supposed that a drainage project would prevent malaria and generally it does, but this one made it. There were perfect nests for breeding anopheles.

When Secretary of this Committee, I wrote on the matter to all the state health authorities, because those things should be under the state health departments. I left the United States then, going to South America, and I do not know what has been done except in two states. I know that South Carolina and Alabama have enforced legislation to prevent that class of malaria caused by railroads and by public roads.

*Read before National Malaria Committee, meeting conjointly with Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Impounded water is a very difficult thing to handle. I cannot go into the discussion of that now, for I do not believe that I am supposed to speak here all day.

When you get a thousand horsepower from water power you have absolutely created it. You have made it out of nothing. During this fall I was in the states of North Carolina and South Carolina, and I think I can safely say that but for the water power furnished by the Catawba River five or maybe ten thousand employes of cotton mills would have been out of work. I believe that we should do all we can to encourage the use of water for power, but at the same time we should do what we can to keep it from being a nuisance. We can pay too much even for it. I believe that I have investigated more of these large ponds than any one else and have seen both the good and the harm that they have done.

I think a railroad can be prevented from making any new malaria and at small cost. The same is true for highways. Drainage projects can, practically always, be constructed so as to prevent more than they make, and I think that they generally do; but I do not believe that these large power plants can be made without making some malaria. I said a few years ago that the impounding of large bodies of water destroyed some malaria-breeding places and made others. The effect of impounding water depends upon three factors: (1) The proportion of anopheles production by the pond to that caused by it. (2) The location of the above productions. If it destroys breeding-places at a distance and causes others near residences, then it may increase the amount of malaria. Even a lessened production of the anopheles then may make—and sometimes does make—more malaria. (3) The changes in the biology of the mosquito. If impounding of water destroys the breeding places of a species that is not so injurious as the species for which it makes breeding places, even a lessened production may make more malaria.

I know of two ponds that I am very sure have destroyed more malaria than they have made, and another has destroyed at least as much as it has made; and yet all three have made, or increased, malaria in some places.

General regulations for governing impounded waters are difficult to make, because we do not yet know enough about it. LePrince, Griffitts and I worked on it for three years, but I cannot think that we have the matter in such shape that we can formulate general regulations for impounded waters yet. But we know enough, certainly, to reduce the amount of malaria caused by impounding water; to reduce it, say, by 60 per cent of what it would otherwise be, and that is gaining. The investigation is still going on. I myself recently have been over a project of the Southern Power Company not far from Charlotte, and for that area have formulated regulations which I believe will minimize malaria so far as economically possible. I use the adverb advisedly because when you require a dollar's worth of work and produce only eighty cents' worth of good—or, what is the same thing, eliminate only eighty cents' worth of injury—that is bad sanitation as well as bad business. But when you spend a dollar that will produce a dollar and a half's worth of malaria control, that is good sanitation as well as good business.

There is one thing about the making of ponds which I would like to say to the health officials here. We have investigated two ponds which are required by the United States engineers to be kept at a constant level. Nothing you can do to a pond with a constant level will prevent it from breeding mosquitoes. I suppose you might put a granite coping around it and sweep it regularly, but nothing else will do it. To my mind, when a pond is kept at a constant level nothing can be done but to move away from it or cut the dam.

DISCUSSION

Dr. L. D. Fricks, U. S. Public Health Service, Memphis, Tenn.—Early in 1919 Dr. Carter called the attention of the authorities in Washington to the importance of man-made malaria, that is, malaria due to the impounding of waters and to highway and railroad construction in regions at least potentially malarious. Dr. Carter stated at that time that he was not prepared to suggest regulations governing impounded waters, but suggestions relative to highway construction were prepared and sent to the Bureau of Public Roads and to all the health officers in the South.

When regulations for the administration of the Water Power Bill were being prepared at Washington during the summer of 1920, the Federal Power Commission requested the Surgeon-General of the Public Health Service to submit general regulations for the protection of the public health in connection with the development of these projects. It was felt that malaria and typhoid fever were the two diseases which should be considered in preparing these regulations, but that many of the new water power projects would be located in regions where neither of these diseases could easily become of serious sanitary importance. For these reasons it was necessary to draft the suggested health regulations on general lines and with minimum requirements in order that they might not interfere with the development of these projects instead of serving to protect the health of the people concerned as they were intended to serve. It is understood that the health regulations which were prepared and submitted to the Federal Power Commission have not been adopted and promulgated by the Commission. But this matter of regulating impounded water projects so that they will not become a menace to the health of the community in which they are located is becoming more and more important every day, as Dr. Carter predicted it would. Within the past few months I have received numerous letters from the state health officers in the South requesting suggestions from the Service for the regulating of impounded waters. In my judgment this matter should be given careful consideration by the health officers of the South and proper regulations should be prepared by each state health officer—not too stringent, else they will defeat the end we have in view by still further retarding the development of the water power in that state, but reasonable, practical regulations which will protect the health of the people during the transitional period (two or three years) of the impounded water project.

The United States Public Health Service has investigated impounded water projects located in the South in relation to malaria for several years and some of its most experienced field men have conducted these investigations, such as Dr. H. R. Carter, Mr. J. A. LePrince and Dr. T. H. D. Griffitts. I am sure, though, you will be glad to know that the Service has recently decided to conduct these investigations on a more permanent and continuous basis. Officers will be definitely assigned to the study of impounded waters in relation to malaria and will be continued on these studies probably for a considerable period of time in the expectation that we may be able to advise the state health officers of the South just what the dangers of increasing malaria by the impounding of waters really amount to and just what precaution should be taken in order to minimize these dangers.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

ACUTE GANGRENOUS OR PERFORATIVE AND SUPPURATIVE RETROCECAL APPENDICITIS*

By Jabez N. Jackson, M. D.
Kansas City, Mo.

I have chosen for discussion before you this morning the acute perforative or gangrenous and suppurative affections of the appendix, and my remarks will be confined to this generally distinctive type. To it, Dr. Deaver is said, some years ago, to have given the designation, "the bad appendix." Our early experience fully confirmed this designation through a distressingly high mortality rate. The observation, however, of certain facts in the history of these cases, with certain changes in our surgical technic, have given us satisfactory improvement in our results, that we deem possibly worthy of consideration.

The retrocecal appendix is of particular interest for several reasons:

(1) Because this anatomical position of the appendix is more common than is usually appreciated, and in this position, owing to certain anatomical features, it seems particularily prone to infections of the type under discussion.

(2) In this position the routes of extension of infection and the ensuing pathologic sequelae are quite different from those in the more normal anatomic position.

(3) With these changed pathologic extensions the symptoms are so different that to one not familiar or carefully observant the diagnosis may be overlooked or mistaken, with consequent unwarranted delay or neglect in the application of proper surgical measures; and

(4) The surgical measures applied require certain modifications to meet the conditions present.

According to anatomists, the appendix is found in the retrocecal position in 20 per cent of individuals. In the general or normal type, the appendix arising from the base of the cecum passes more or less downward and toward the midline of the body. It communicates thus with the general peritoneal cavity. The designation retrocecal, on the other hand, is given to those appendices which from the base of the cecum pass upward and backward to the outer side of or behind the cecum and ascending colon. This type is, therefore, confined to the lateral peritoneal fossa, outside the colon, and extends upward toward the kidney and liver.

ANATOMICAL VARIETIES

In our experiences we have observed four distinct anatomical varieties of the retrocecal appendix:

(1) The simplest form presents the usual mesentery and only differs from the normal in its position and course.

(2) A second variety passes upward, outside the colon beneath the peritoneum of the lateral iliac or lumbar fossa. It is without mesentery and is often, in fact, really retroperitoneal, its anterior half alone invested by peritoneum. Curiously, however, it is usually free at its tip above and there completely invested with peritoneum.

(3) The third type passes upward along the lateral wall of the cecum and colon, and its peritoneal covering is that of the colon wall. The half lying in contact with the gut wall likewise has no peritoneal investment. In this type we can readily see how an abscess may rupture into the gut and thus spontaneously evacuate and cure itself.

(4) Finally, there is a fourth variety, quite rare. In this instance the appendix passes upward directly beneath the cecum

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and ascending colon between the layers of the meso-colon, and is thus a true retroperitoneal appendix.

PATHOLOGICAL SEQUENCE

Practically speaking, there may be roughly considered to be two stages in the pathologic development of acute appendicitis:

(1) The stage in which the infection is confined to the appendix itself.

(2) The stage in which the infection breaks through the gut wall and is extended to surrounding structures, the peritoneum generally, or in certain instances the cellular tissues, or in rarer instances into the blood stream, particularly the veins.

In the first stage, the course of the disease is the same regardless of the position of the appendix. In this stage an excision of the appendix removes the entire focus of disease and a quick recovery is expected, with practically no mortality. Hence, there is the urgency of early diagnosis and early operation.

In the second stage come changes, particularly in the ensuing peritonitis and its extensions. In the normal type of appendix the general peritoneum is more or less exposed and its diffusion is the element of chief importance.

In the retrocecal appendix the peritonitis is primarily extended to the lateral or lumbar peritoneal fossa and is usually early confined by adhesions to this space outside the colon, which rather effectually shuts it off from the general peritoneum on the inner side of the colon. Its extension is henceforth upward to the outside of the colon toward the kidney and the under and posterior aspect of the liver. In occasional instances, when the infection reaches the hepatic flexure of the colon, it may pass forward beneath the liver toward the gall-bladder and an ensuing sub-hepatic abscess may develop. This may be mistaken for an empyema of the gall-bladder, or its extension.

More commonly the extension is upward between the diaphragm and the upper surface of the liver and there is a resultant sub-phrenic abscess. From this focus the infection may perforate the diaphragm and, involving the pleura, produce either a general or a localized empyema. Or in case of adhesion of visceral and diaphragmatic pleura, the abscess may enter the lung substance and produce a lung abscess, or break into a large bronchus and be coughed up. In our early experience we had one case of this type in which a large abscess broke suddenly into a bronchus, was coughed up and, inspired into the opposite lung, literally caused death by drowning the patient through his draining abscess. A second case of drainage through the bronchus was thereby apparently relieved and finally recovered.

Beside these peritoneal extensions, we have also to consider the extensions through the cellular tissue. This route of extension may occur either directly from a perforation of the retroperitoneal portion of the appendix in either type two or type four, or secondly from adhesion and necrosis with perforation of the posterior parietal peritoneum. We had two of these cases in which a bulging abscess presented behind the crest of the ileum and required simple incision and drainage with recovery. One other case was observed in which the infection penetrated the posterior muscular parietes, reaching the subcutaneous fatty tissues, with extensive cellulitis and abscess beneath the skin of the whole lumbar region and extended down over the buttocks and in the thigh, almost to the knee. This case died of septicemia, despite multiple incisions and drains.

One other case of retroperitoneal abscess we observed which was opened by a free lumbar incision. The perinephritic fat was destroyed and the kidney floated out of the wound. This case was operated upon in the country. Later the patient died and an autopsy was made. This revealed a further retroperitoneal extension across the spine to the opposite lumbar fossa, which presented another large abscess.

In the fourth type, the extension of infection is prone to enter the psoas muscle with more or less extensive destruction. The infection in this location is intimately associated with the origin of the meso-colonic veins and a septic thrombophlebitis occurs. Through this route the liver

is reached, with resultant liver abscess, generally multiple. Two such cases we have seen clinically and later observed at autopsy. In each case a gangrenous appendix of the fourth type was found. Likewise necrosis, in one case quite extensive and in the other localized, was found in the substance of the psoas muscle. In one, millions of small infarcts with early abscesses of the liver were the sequence. In the other, more advanced, two very large abscesses were found, one in each lobe. A third case of liver abscess, following this sequence, we were fortunate enough to localize, find solitary, drain and cure.

All of these varied complications were seen in our earlier experiences. They represent largely failure in early diagnosis with consequent neglect in operation. In part, however, they followed, we now believe, inefficient surgical treatment. In the past ten years these complications have not been seen.

SYMPTOMS AND DIAGNOSIS

In the interpretation of symptoms and in the correct diagnosis of these cases we believe that again our gross division of acute appendicitis into two distinct stages is helpful. The symptoms in the first stage are distinctive and are the same regardless of the position of the appendix and only varied by the intensity of the infection. These symptoms may be further differentiated into (1) the constitutional, or symptoms of infection in general; and (2) the special or local symptoms which point the way to the identification of the focus of infection.

(1) The constitutional symptoms are mainly elevation of temperature and pulse, general depression and blood changes, in these acute cases, represented by the leucocyte count. They are chiefly important (a) in proving that we have an infection process to deal with and not, for example, a simple colic; and (b) to indicate in some measures, at least, the intensity of the infection which may inform or warn us of the probable course and termination.

(2) The local symptoms call for close observation in the diagnosis of the retrocecal or other position of the appendix. The initial local symptoms of any acute appendicitis are gastric and epigastric as a rule: rather sudden onset of rather severe pain usually referred to the stomach or at least the upper abdominal region; more or less vomiting, sometimes persistent and severe. These with the infectious symptoms mentioned, constitute the characteristic onset of acute appendicitis and may be the only symptoms of the first stage.

The second stage, as we have noted, marks particularly the extension to the peritoneum and consequent peritonitis. With the approach of this stage there is commonly a group of symptoms indicative of peritoneal irritation or congestion which precedes actual peritoneal involvement and infection. This is marked by a more or less widespread pain in the lower half of the abdomen, with possibly some lessening of epigastric pain and gastric symptoms. With this pain and indicative of parietal peritoneal reaction is the appearance of general tenderness on pressure and abdominal rigidity. Thus far our pathologic processes and clinical symptoms are identical. From now on, with the onset of the true second stage, our extensions and our symptoms lead to divergence in the two types. The normal appendix, as we have indicated, communicates rather freely with the general peritoneum, including the parietal peritoneum, and in this type, owing to parietal peritonitis, the general abdominal pain, tenderness and rigidity persist until localization occurs, when they are prone to settle down as watchdogs over the local focus of infection underlying.

With the retrocecal appendix, the ensuing peritonitis is usually quite restricted and is quickly covered by adhesions of the cecum and colon to the lateral parietal wall. The general parietal peritoneum is thus not involved, except for a brief period. The signs of abdominal pain, tenderness and rectus rigidity may and do, therefore, quickly disappear. And on pressure on the anterior abdominal wall over the region of the appendix we will find little or no rigidity and little or no tenderness under pressure. Even deep pressure may elicit no tenderness. The cushion of gas in a probably distended

cecum prevents the pressure from reaching the infected and inflamed peritoneum sheltered beneath it.

When the appendix communicates with the general peritoneum, we can ordinarily later find when the peritonitis localizes, a tumor, partly the expression of a local abscess forming, sometimes the result of infiltration and edematous thickening of all the structures involved in the localization, parietes peritoneum, intestines, omentum, etc.

These similar processes which occur about the retrocecal appendix, however, are masked largely by the overlying colon. Sometimes a suggestion of fullness can be detected on careful palpation well outside the colon and toward the back. Sometimes nothing can be felt even under anesthesia. If, however, one will make deep pressure with the fingers above the crest of the ileum posteriorly and in the lumbar fossa one may elicit a very distinct, often severe, tenderness, totally unsuspected by the patient before search. The posterior tenderness on pressure is a valuable diagnostic sign when taken in connection with a proper antecedent history.

In the absence noted or in the rapid subsidence of the commoner symptoms, which are really those of peritonitis, the medical man is ofttimes much upset in his diagnosis. The signs of general infection (fever, leucocytosis and pulse disturbance) will still persist, but now often only confuse the diagonsis. Often a physician brings in a case with about the following remarks:

"Doctor, when I first saw this patient, I thought he had appendicitis. But in a couple of days all the symptoms of appendicitis were gone. His fever kept up, however, and I then thought he probably had typhoid fever. However, the course has not been that of typhoid fever and now I do not know just what is the matter, so I have brought him to you."

The proper diagnosis will require (1) an accurate detailed elicitation of the symptoms of the first twenty-four to forty-eight hours, which are of paramount importance; (2) an appreciation of the fact that the later signs of appendicitis are chiefly those of peritonitis, and that in the retrocecal appendix this peritonitis is confined to the limited space outside of and largely behind the cecum and colon; (3) the evidence of continued infection; and (4) the slight stiffness and the distinct tenderness on pressure above the crest of the ileum in the lumbar region.

TREATMENT

The treatment of retrocecal appendicitis as of appendicitis anywhere is surgical. Early diagnosis and early operation is of course indicated here as elsewhere. But we are not in this discussion considering cases reached by the surgeon at this happy stage. We are here concerned only with those which have passed on to gangrene or perforation with attendant suppuration and abscess formation. As a rule these, like others, are operated upon as soon as they come under observation. There is not here, however, the same acute danger as where general peritonitis is a threat. In certain types, therefore, we take time to load the patient up with glucose and bicarbonate of soda, by proctoclysis and hypodermoclysis to develop an alkaline reserve, wash out the stomach (by lavage) and colon (with enemata alone) to get rid of gas and lessen the dangers of post-operative intestinal paresis. We thus may convert an apparently very sick patient presenting great surgical risks into one able to meet his ordeal readily. This delay does not mean more, as a rule, than twenty-four hours.

INCISION

We have found the McBurney incision to give us the best access to these appendices. Usually it requires extension by a free incision of the muscles backward to give adequate exposure, particularly if the appendix runs up high toward the liver. The straight outer rectus incision throws us too far to the inside of these appendices and exposes the general peritoneum to infection. After free incision we find ourselves in the free peritoneal cavity with no adhesions to the inner side. Before attempting to enter the abscess the general cavity is thoroughly protected by hot moist gauze packs placed over to the inner side of the colon throughout the length of the wound. Then with the index finger hugging the lateral parietal wall we bear down between it and the colon or cecum and thus reach readily the abscess. Mopping out the pus cleanly, all

adhesions to the lateral parietal wall are freely separated and the colon is thus mobilized from the lower end of the cecum upward as far as necessary. We are thus able to see pretty well the field of involvement. In all cases we aim to get the appendix and remove it *in toto*. We can usually find some normal appendicular structure, either at the base or at the tip, from which known structure we begin our enucleation.

In only a few instances is there complete gangrene without recognizable structure of an appendix left. Sometimes the surrounding tissues are so infiltrated, thick and hard that recognition of the appendix is difficult. But somewhere, if our exposure is adequate, we will find recognizable ground for a start. Vessels are clamped as developed. When the appendix runs along the colon wall (as in Type 3) great care is required to avoid a tear into the gut.

After freeing the remnants of the appendix we endeavor to find a healthy base for ligation in order to obviate the chance of a subsequent fistula. For similar reasons the raw area and the stump are covered as completely as possible by sutures extending into normal peritoneum on either side. The colon will tolerate considerable infolding and with experience it is rather remarkable how complete a peritoneal covering of extensive raw surfaces can be obtained.

The next step constitutes the one which in our experience has spelled the difference between high and low mortality. This is that of proper drainage. With the body in the horizontal position there is quite a basin above the crest of the ileum in the lumbar fossa. A drain passed simply down to the base of the appendix does not reach and drain this basin. In one of our early cases, drained through the anterior wound in the usual way and drained apparently well, we found our patient still maintaining a septic course. After a morning dressing with supposedly careful cleaning under irrigation, in reaching under the loin to lift the patient for removal of a Kelly pad we, to our surprise, pressed out thus over a half pint of pus retained behind in this basin. This led us to make a free lumbar stab and introduce a large rubber tube of one inch diameter for drainage of this area.

With the finger, through the anterior incision, we can locate this lowest spot above the crest of the ileum and then stab through a counter wound adequate for the tube drain. With a pair of forceps passed from behind into the cavity and out through the anterior wound, the large tube is seized and drawn through until its inner end is left just above, flush with the peritoneum of the fossa. It should not project too far inside lest it press against the gut and by pressure necrosis induce a fistula. After placing drain properly it is fixed by a suture of silkworm gut. This simple experience revolutionized our results. Many of the disasters mentioned earlier in our discussion had followed operation as then done and our mortality had been over 25 per cent. Since the routine introduction of this method of drainage it has been reduced to almost nothing. In looking up the results in one of our services for the last five years we find, in this one series alone, sixty-seven cases of this type with but one death. This death was from nephritis in a case brought in from the country and operated upon at once to accommodate the family doctor, who wanted to get home on the next train. This is the only death we can recall in our five years' consecutive experience. Most of our disasters were before our knowledge or use of the Fowler position. Perhaps this position alone might improve ordinary results, but we do not believe so to the extent we have secured by such drainage with the ordinary recumbent position. It is the point in technic, therefore, upon which we wish to lay stress.

After installation of lumbar tubular drain, a cigarette drain is introduced at the lower end of the incision down near the apex of the cecum. When the perforation takes place at the base of the appendix, which is at the crest of the drainage divide between the lumbar basin behind and the pelvic basin below, it is well to recognize that some of the leak may spread also into the pelvis. In this instance, after cleaning out the pus in the pelvis, the cigarette drain is carried down to the floor of the pelvis. The remainder of the incision down to the drain is then

sutured in layers, muscle aponeurosis and skin.

Finally it is of value to remember that during our operative manipulations the parietal wound has been exposed to considerable infection and that necrosis of fat and fascia are frequent. To lessen the extension of such infection and thus to save the integrity of our abdominal wall, we order the immediate institution of continuous hot fomentations applied directly to the wound. Moist heat increases exudation, lessens absorption and enables us to lessen and in some instances entirely to avoid extending infection and fascial necrosis. It thus shortens convalescence and lessens liability to weak walls and subsequent hernia.

DISCUSSION

Dr. Richard A. Barr, Nashville, Tenn.—I fully agree with Dr. Jackson except on one point. He did not say so definitely, but I inferred that he rather inclines toward drainage of the peritoneum. My idea of the difficulty in this retrocecal type of case is that you so frequently have a retroperitoneal infection, for even where the appendix is not primarily retroperitoneal, in getting at the appendix for removal you open into the cellular tissue. In the case of the appendix that has a definite mesentery, though it lies to the outer side of the colon, it can be removed without any injury to the posterior parietal peritoneum and the post-peritoneal cellular tissue is not subjected to infection. If the appendix is intraperitoneal and can be removed without opening into post-peritoneal tissue it is not my custom to use any drainage at all. I do not attempt to drain the peritoneum unless I have an unclosed perforation, or unless I anticipate one, but always in these post-peritoneal infections I do put in drainage, and put it in as does Dr. Jackson. If I am able to recognize a retroperitoneal abscess I open it posteriorly for drainage purposes only. If I am unable positively to recognize retroperitoneal involvement, I open anteriorly. The trouble with anterior drainage is that the posterior parietal peritoneum drops together after the operation and you drain in front of that while your retroperitoneal infection continues. If you are careful about putting in drainage from the front, and see that it extends into the retroperitoneal space, it will be satisfactory. The lumbar drain that does not have to drain across the peritoneum anteriorly is the proper one. Dr. Jackson did not say whether he put in an anterior drain in addition to the lumbar stab. I personally put in the posterior drain and close anteriorly throughout. Some of the wounds heal primarily and some develop infection, though I feel sure that this is less common and the infection less severe than when an anterior drain is used.

Dr. Stuart McGuire, Richmond, Va.—I am glad to hear a discussion of appendicitis again on the floor of a surgical meeting. Time was when it occupied a frequent place on our programs, but recently we have treated the disease like a poor relation, although the fact is it gives us a large proportion of our income. Appendicitis is as frequent as it ever was, and the mortality is higher than most of us realize. Some surgeons operating under favorable conditions are able to report large series of cases with marvelously few deaths, but an examination of all available reports of hospitals in the United States shows that today the mortality is 10 per cent. This is not of the acute cases, but of the acute and chronic as well.

There is no longer any question of whether to operate for appendicitis or when to operate for appendicitis; but there is room for discussion of how to operate for appendicitis, because the method employed depends upon the nature of the case. Dr. Jackson has called our attention to a common and very fatal type. I divide cases of appendicitis into four groups and try to assign a patient to one of these groups before I operate: first, chronic appendicitis; second, acute appendicitis; third, acute appendicitis with diffuse peritonitis; and last, appendicitis with localized abscess. An abscess the result of appendicitis in some instances is adherent to the abdominal wall and may be opened and drained without going into the peritoneal cavity. The kind described by Dr. Jackson, however, is behind the peritoneum and can only be reached by opening the peritoneal cavity. This type gives us a large mortality, not, as the Doctor said from peritonitis, but from septicemia. My plan has been to wall off with gauze, separate the cecum and open the abscess, remove the gangrenous appendix, sponge out the pus and drain anteriorly (gauze and rubber tissue). Drainage is the keynote of success and the effectiveness of the drainage determines the fate of the patient. I realize that in an uphill fight we need a down-hill drain, and Dr. Jackson's suggestion of using a tube introduced through the loin is based upon sound principles. I have never practiced the method, but shall bear it in mind when I have such cases to deal with in the future.

Dr. Francis LeS. Reder, St. Louis, Mo.—One fact the Doctor did not mention, and it is not mentioned very often in connection with retrocecal cases in this type of lesion: we mean those cases that have not the help of the peritoneum, the patient's greatest asset during an attack of appendicitis, and that is the attack upon the abscess through the rectum. I assume on account of the mention of drainage that we have to deal with pus. In operating upon these cases, as Dr. McGuire has said, we should spare the abdominal cavity. Opening with drainage through the rectum, provided your examining finger is sufficiently educated to detect swelling and fluctuation, will give 50 per cent of success. When recovery has taken place and the subsequent removal of the appendix, i. e., what is left of the appendix, is deemed advisable, it can be done in the usual way.

In speaking of the peculiar conditions that may arise through appendix lesions, let me cite one case in which a patient nearly died through my carelessness, not my ignorance. It was a retrocecal appendix lesion with an abundance of chocolate colored fluid in the abdominal cavity. The Kocher incision was made—as a precautionary measure a suprapubic opening for drainage was also made. On the fifth day the right epididymis began to swell and caused great pain. I looked for a venereal lesion, which was not there. It was found, however, that the pus had burrowed along the cord into the scrotum, infecting the cellular structures and producing a large abscess in the scrotum.

Another form of pus burrowing reveals the infection near the hip joint. This usually happens when a patient is thought to be convalescing. These are the cases that are not infrequently diagnosed as "hip joint" troubles.

I cannot impress upon you too forcibly the desirability of keeping this subject of appendicitis actively before you. It is one of the most frequent forms of disability we have and the mortality is still much too high.

Dr. R. M. Harbin, Rome, Ga.—We all know that the postcecal type is the bugbear in operating for appendicitis and the difficulty of diagnosis is a great handicap. I am glad Dr. Jackson stressed the first twelve hours of the history, for we slip on that failure so often.

There is only one point that I wish to bring out, and that is the diagnosis of this type of case. We do not have the local tenderness and in the presence of positive urinary findings the diagnosis is much more confused. There may be the retrocecal appendicitis plus pus in the urine and other urinary findings and then one must be on the alert to make the distinction, as there may be a coincidence of these two pathological conditions. Three points in the diagnosis always help even in the presence of positive urinary findings. First, the initial nausea, and second is the retraction of the thigh, which points to a septic inflammation about the muscle, and the third point is the increasing leucocytosis.

Dr. James T. Wolfe, Washington, D. C.—How many times have I seen men use a large cigarette drain, pull it out and plug in another for twenty-four hours. Only after its removal will pus discharge and then they plug up the incision again. It has been my practice to use a large rubber tube, nearly an inch in diameter, and also to have eyelets in the lower end of the tube. It is this type of case that has caused me to discard the gridiron incision entirely in appendicitis. The right rectus incision gives an opportunity for better approach. The gridiron incision will give more post-operative hernias than the right rectus in pus cases because we have in the right rectus a muscle that is highly resistant to infection, whereas fascia has low resistance due to poor blood supply. It has been my practice, if I find the omentum adherent, to work to the outer side of the colon, tracing down to the appendix, and if I find it retrocecal, I have not invaded the peritoneal cavity because it is walled off. I drain through the right rectus. Another feature is that you can drain more effectively by turning the patient on the right side.

Dr. Jere Crook, Jackson, Tenn.—If we have the symptoms referred to, especially the rigidity with the effort of the upper peritoneum to come to the rescue, it means that we have peritonitis. That feature appealed to me especially. Another point is that with right rectus rigidity I make the incision low down near the iliac bone and use the gridiron incision about one inch from the bone. If you make the low incision you have access to the cavity you are trying to drain. If we put in a tube, cutting out a U-shaped section, and put that down underneath the colon, it is possible to get all the drainage needed in every instance. I do not use a cigarette drain in pus cases, as it serves simply to retain the pus instead of evacuating it.

Dr. Jackson (closing).—I am not talking about early diagnosis in these cases. These are all cases that came in after suppuration and gangrene had taken place. However, if we will recall some of these facts presented it may be possible to get an early diagnosis. If you understand this there are certain things that are characteristic. We must keep in mind the various pathological sequences that may ensue, for they are not all the same. These are all drainage cases and this must be remembered. You may say that this simple point of drainage does not amount to much, but it reduced my mortality to nil from 50 per cent. I have no more fear over a retrocecal appendix today than over a clean abdominal case.

Incidentally, I wish to say that in all cases I take the appendix out. I never simply open and drain an abscess, for if I do I leave an old infected organ that may give rise to secondary infection. In one case in which the appendix was not removed there was an abscess which spread over to the opposite side and the patient died.

In type three, where the appendix runs right along the side of the gut, in taking it out you are digging into the intestinal wall and it is easy to tear the colon wide open unless you are careful. If you put a drain down somewhere near the bottom of the infection you will get a fecal fistula. I put the drain in the back and do not let it stick up at all, and then I make no other drainage and there is no contact with this mass of infected tissue and we never know what a fecal fistula is. I think, as Dr. Crook said, that we get better drainage if we make the McBurney pretty well out. It makes no difference if you cut the muscle, for you get more space. I have seen cases where the appendix ran clear up between the liver and the diaphragm, but if you get it out and put drainage in the cavity you will have no trouble. The spreading cellulitis that the Doctor mentioned as occurring along the fissure is prevented by this posterior drain. I think you get less of that as you go farther out. The outer side is a well vascularized muscle and not nearly so liable to slough.

TRANSFERENCE OF THE CREST OF THE ILIUM FOR FLEXION CONTRACTURE OF THE HIP*

By Willis C. Campbell, M.D.,
Memphis, Tenn.

Flexion contracture of the hip joint, if above 60 degrees, renders the extremity practically useless, and when both limbs are affected the individual becomes a quadruped, as walking in an upright position is impossible. Lordosis may compensate for 45 degrees flexion, but causes a continuous strain on the spinal structures, and the entire skeletal system is out of balance. This deformity may occur through various etiological factors, but infantile paralysis is more frequently the cause. In the foot, ankle, knee and other parts prevention of deformity has, for many years, been urgently advocated and strictly carried out by the orthopedic surgeons, but such measures are enforced with difficulty in the hip joint. When the affected child or adult lies in bed during the acute stage the flexed position of the knees and hips is more comfortable and may actually relieve pain. The hips, by gravity, become abducted. If there is a loss of muscle balance by paralysis of the adductors and extensor muscles of the hip, the active flexors and abductors are gradually contracted until the position becomes fixed. Any mechanical or surgical procedure to correct must take into consideration both factors, flexion and abduction.

Subcutaneous tenotomies and fasciotomies for flexion deformities of the hip joint are most unscientific and haphazard. Structures are blindly severed, and later, torn and traumatized, when the hip is forcibly extended, the space between the severed surfaces is filled with blood clots which later organize into fibrous tissue, renowned for subsequent contracture. The object of these measures is rarely accomplished. The deformity is not over-corrected, which factor is essential for permanent success in the management of all deformities. Relapse to some extent occurs as soon as walking and sitting is permitted, which positions are obviously conducive to recurrence.

Dr. Robert Soutter, of Boston, has described an excellent reconstructive operation, along anatomical lines, for flexion deformities of the hip, the essential points of which are as follows:

(1) An incision is made parallel to the line of the femur, one and one-half inches posterior to the anterior superior spine, extending two inches below and two inches above.

(2) The tough fibers of fascia lata, extending from the top of the trochanter to the anterior superior spine, are severed.

(3) The anterior superior spine is exposed, an osteotome strips the periosteum from this structure, peeling it away from the crest, extending two inches backward to the inner and outer side. The periosteum, with muscles attached to the anterior spine, is removed downward to below the anterior inferior spine.

(4) The hip is hyper-extended and held in this position by plaster or apparatus.

This method is a decided advance when compared with any employed in the past and we have had many gratifying results, but have frequently been unable to reduce abduction. Usually the hip can be extended, but not with the limb parallel with its fellow of the opposite side, which is due to a shortening of the abductors. This problem we have combated by a modification of and an addition to the Soutter operation, which is of enough advantage to warrant description. We have in our routine used this technic for the past two years, during the last nine months, since January, 1922, in over 30 cases. The results have been 100 per cent successful and especially valuable in quadrupeds from infantile paralysis, frequently seen in the South. Many of our cases are from rural districts where the prevention of deformity is not so well carried out as in more densely populated areas, and where the physician has more ready access to his chronic patients. We have found the procedure not alone of value in contractions of infantile paralysis, but also in infectious arthritis, hemiplegia, spastic paralysis and congenital dislocation of the hip in older children, when abduction could not

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

be relieved, thus avoiding osteotomy. Our technic is as follows:

The skin is incised along the anterior one-half or two-thirds of the crest of the ilium to the anterior superior spine and then downward to the outer aspect of the

Fig. 1.—Skin incision.

rectus muscles for about two or four inches, a typical Sprengel approach to the hip, recently advocated by Smith-Peterson. The superficial and deep fascia is incised to the crest and anterior superior spine. With a sharp osteotome the ante-

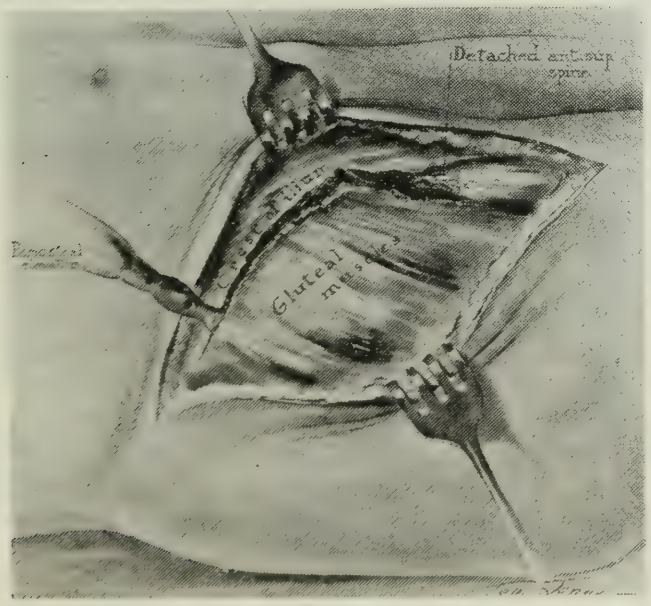

Fig. 2.—Gluteal muscles with small portion of crest of ilium being detached.

rior superior spine is removed. The outer one-fourth of the crest is chiseled through, from before backward, or the anterior two-thirds, or the entire crest, as the occasion demands, after which a heavy osteotome peels the entire mass, subperiosteally downward to the rim of the acetabulum, above which a tract of bone is denuded about one inch in diameter and parallel with the crest of the ilium. The raw sur-

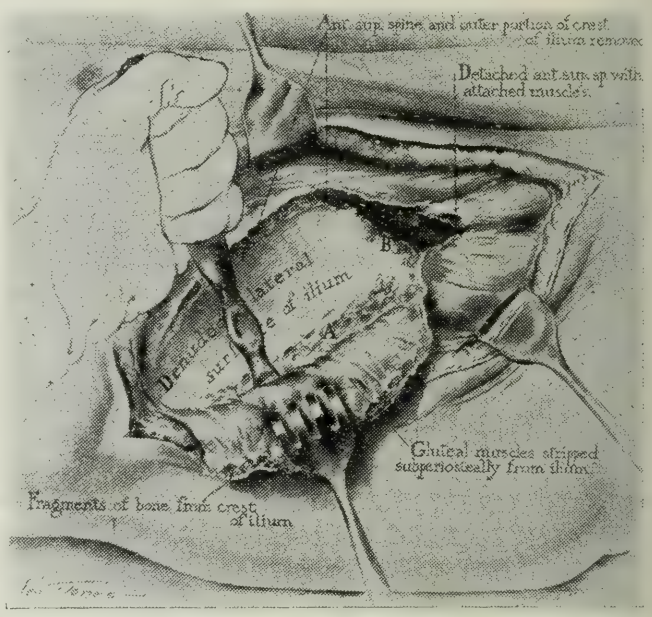
Ant. sup. spine and outer portion of crest of ilium removed
Detached ant. sup. sp. with attached muscles
Gluteal muscles stripped subperiosteally from ilium
Fragments of bone from crest of ilium

Fig. 3.—A. Surface of bone roughened to facilitate new attachment. B. Surface of bone between anterior superior and inferior spines roughened for new attachment of flexor muscles.

faces of the transferred crest of the ilium and anterior spine fall, by gravity, so that raw bony surfaces approximate. If this

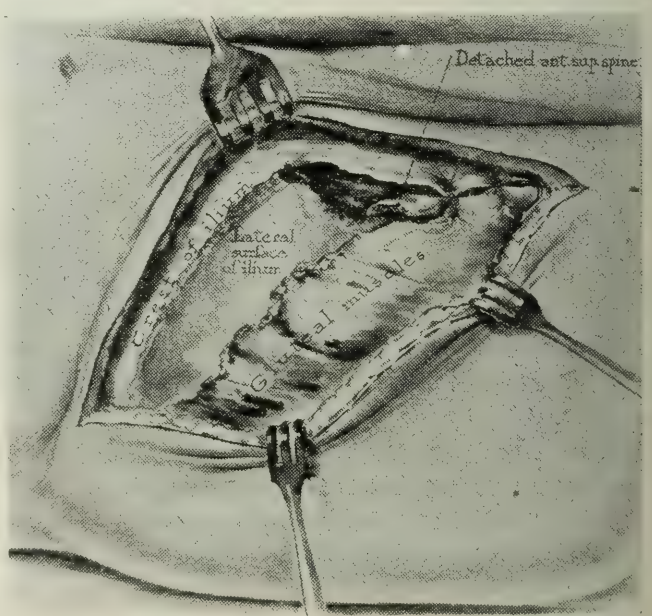

Fig. 4.—Ready for closure. Gluteal muscles dropped into new position, and fascia partially closed over detached anterior superior spine.

does not reduce flexion, the anterior structures, such as psoas, fascia or capsule of the hip joint may be easily attacked. The

superficial fascia above is stitched to the deep fascia, at a point below, bringing the skin incision about one inch below the crest of the ilium, avoiding possible pressure. The skin is closed with dermal sutures.

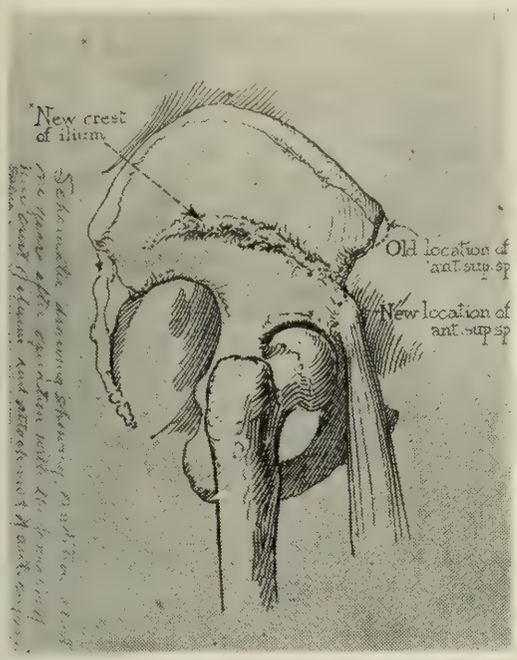

Fig. 5.—Schematic drawing showing condition about one year after operation with the formation of a new crest of the ilium and attachment of the anterior superior spine.

Plaster cast is applied in hyperextension, which remains eight weeks. We have had no fatalities and there have been no alarming symptoms. In from two to three

Fig. 6.—Extreme hip flexion contractures prior to operation.

months a massive bony ridge can be found, along the line of attachment of the new crest. Hence the operation is designated "transference of the crest of the ilium."

In order to illustrate the type under consideration, though practically all hip contractures are amenable to this procedure, one case will be briefly narrated:

Fig. 7.—Front view of the same case after transference of the crest of the ilium.

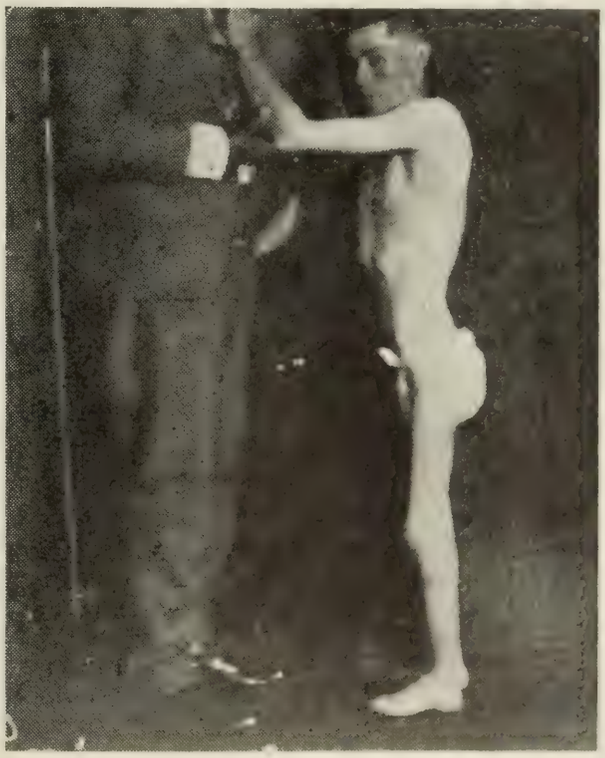

Fig. 8.—Side view of the same case after transference of the crest of the ilium.

Case I.—A boy, Clarence Wheeler, age 18, when two years of age had infantile paralysis, causing an extensive paraplegia with flexion of both knees, calcaneovalgus of both feet, and extreme flexion and abduction of both hips, so that he was

unable to progress even as a quadruped. His method of ambulation was on both hands and buttocks. He was a human tripod or "triped," if such a term is permissible. The feet and knees were corrected by operation, a description of which is irrelevant to the subject in question. On each hip the crest of the ilium was transferred as above described, completely correcting the deformity, as shown in the illustration.

869 Madison Avenue.

DISCUSSION

Dr. Lawson Thornton, Atlanta, Ga.—In Atlanta we see a good many cases of infantile paralysis with varying degrees of flexion deformity at the hip, and have in almost all cases been able to correct this contracture by the operation devised by Dr. Robert Soutter. However, in a small number of cases this procedure alone has not been sufficient. Two cases required osteotomy of the femur to completely overcome the deformity.

The operation which Dr. Campbell has presented to us will be of great value in the treatment of this extreme type of hip flexion deformity.

Dr. W. B. Carroll, Dallas, Tex.—I had the pleasure of seeing in Dr. Campbell's Clinic a few days ago several cases operated in this manner, and also saw him do one operation. The technic is simple and the correction after incision had been made was much easier accomplished than similar cases done with the Soutter. I have been accustomed to doing these severe cases in two stages, leaving the thigh in ten or fifteen degrees flexion for ten days, then placing it in plaster in hyperextension. One should be careful in making a radical change in position of leg on account of the possible damage to the femoral vessels. This would apply in Dr. Campbell's operation as well. The advantage Dr. Campbell has is gained by releasing the gluteus medius, which is undoubtedly in an important structure in the flexion and abduction deformity.

Dr. Robert F. Patterson, Knoxville, Tenn.—Dr. Roberts, of New York, strips down the gluteal muscles from the ilium in the treatment of the so-called gluteal myositis.

I wonder if Dr. Campbell would get the same result by stripping off the muscles as by chiseling off the crest of the ilium?

Dr. Campbell (closing).—We are using this operation routinely in practically all contractures of the hip. There have been no complications and no fatalities, as we accomplish a definite procedure based upon proper mechanical principles. I believe that the removal of the crest with the attached outer one-fourth and denuding the dorsum of the ilium gives an attachment of the muscles which is more firm than if simply severed and left loose in the soft tissues. Also that bony union between these points makes subsequent contracture impossible, whereas this might often occur if the muscles were loose in the soft tissues. There is no interference with blood or nerve supply, the attachment is simply transferred to a point below correcting the deformity and in no way inhibiting physiological muscle action.

THE TREATMENT OF CARCINOMA OF THE BLADDER*

By William Neill, Jr., M.D.,
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Baltimore, Md.

It is but a comparatively short time since a patient suffering with hematuria rested in the hands of the general practitioner, attributing such remissions as might be enjoyed to the medicines which were administered. Great stress was laid upon the importance of examining the urine to determine the source of the bleeding. If the blood was bright red, the lower urinary tract was responsible, while if the blood was intermittently mixed with the urine or ureteral clot-casts appeared, the kidneys or ureters were held guilty and appropriate medication was prescribed. For two decades cystoscopy and the ability to examine the bladder, ureters and kidneys has altered not only all former methods of diagnosis, but methods of treatment as well, and the treatment has become direct, purposeful and aggressive.

Of the various causes of blood in the urine, bladder tumor is the commonest. No more distressing condition, from the patient's standpoint, is met with than tumor of the bladder, and no other condition offers greater difficulties from the standpoint of effective treatment. The condition is met in all periods of life, but as is the case with all tumors, it is more common after middle age. The course is prolonged and the tendency is for the condition to remain confined to the bladder, although metastasis to the pelvic bones may occur early, and for that reason an x-ray plate of the pelvis should be made in all cases before treatment is begun.

The first operation for tumor of the bladder was done by Warner, in 1747, through a lateral perineal incision. Simon, in 1875, removed growths from the female bladder through his urethral specula. In 1814, Billroth first operated successfully upon a bladder tumor from above, and later the suprapubic route was made popu-

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lar through the insistence of Guyon. Operating through the vagina into the bladder was done thirty years ago. Franz, in 1880, advised the total removal of the bladder, and twenty-five years later, in 1905, Watson advocated the complete removal of the bladder in all cases of cancer where the disease was confined to the bladder itself. Deliberate, systematic operations for tumors of the bladder scarcely date back thirty years.

The etiology of this condition, as with new growths elsewhere, is not definitely established. Some contend that in a large percentage of cases there is a history of chronic cystitis, or stone, or some form of long standing bladder irritation. In our experience we have observed this in a comparatively small number.

Despite the notable advances in surgical technic during the last decade, the treatment of carcinoma of the bladder continues to occupy a prominent place in the thoughts and problems of the urologist. The results of all incisional forms of treatment in the past have been so discouraging as to make bladder tumor cases unwelcome in the practice of urology, and not infrequently altogether to preclude conscientious surgical intervention. The results following the excision of tumors, whether it be local removal or a complete cystectomy with transplantation of the ureters, have been far from brilliant. Up until the past eight years it was generally accepted that for a cure, a wide and clean excision offered the best method. The routine surgical removal in carefully selected cases, which at its best is dangerous and difficult, shows recurrences in from 75 to 80 per cent and that the operative mortality is high.

Before instituting treatment all data should be well in hand, any complicating disease should be discovered, and its relation to any proposed line of treatment considered. The kidney function should be determined, as the cause of death is usually from uremia with infection of the entire urinary tract and not primarily from the disease itself. Any patient with a history of bladder irritation and hematuria should be examined with the cystoscope. For many years at our clinic the open air cystoscopic technic of Dr. Howard A. Kelly has been in daily use. It is convenient, rapid, and affords direct information as to the bladder surface and allows the widest range of manipulating procedures within the entire bladder. Although Dr. Kelly demonstrated the possible use of this method in males as early as 1893, it was not employed by urologists for the male, and we ourselves had for years used only one or the other of the various modifications of the lens system water cystoscope. While painless and best in females, it is not so convenient in males. An exaggerated Trendelenburg posture, with the head of the table lowered to an angle of 60 degrees, as advocated by Dr. Georges Luys, of Paris, gives a very effectual air dilatation to the male bladder in all except contracted irritated bladders and very fat subjects. In these a general anesthetic will usually give the desired results. This method presents incontestable advantage for seeing these tumors in their actual state and in determining their number, position, size and relation. A characteristic and definite clipping can easily be taken under direct vision for microscopic study. This method of cystoscopy is in every way superior to interposing a watery medium and peering through lenses when the view is often obscured by murky fluid, and the examiner is harassed by the technical difficulties of the electrical equipment and by the manifest discomfort of the patients. Air distension is a better method also, as it has a greater range of service in that it permits the examiner to measure accurately distances in the bladder, and with the diameter of the cystoscope as a guide, to determine the actual size of the tumor, which is imperative in determining the type of therapy to institute. Such a careful examination as is possible through an open air cystoscope makes for a more thorough scientific handling of the case and greatly enhances the interest of the work. The chief difficulty with this method of cystoscopy is inexperience with the use of the head mirror and a reflected light, which after a little practice is soon overcome.

All patients with hematuria should be cystoscoped with this condition in mind. Neglect to do this has allowed many small and easily treatable papillomas to develop

into hopeless malignancy, and a comparatively simple condition to reach a most serious proportion, with the case desperate and the treatment extremely difficult and unfortunately less effective.

All bladder growths are potentially malignant. There is a definite class of pedunculated tumors, often multiple, with no underlying induration of the mucous membrane, which respond well to fulguration. This type of treatment was first presented through the pioneer work of Edwin Beer, in 1910. However, it is often impossible to distinguish between a papilloma which will respond to fulguration and one that will not, either by visual inspection or histologically. All other types of bladder tumors seem to be made definitely worse by fulguration.

It is of the utmost importance to get the case under examination and treatment at the earliest possible moment. This can only be done by investigating at once and tracing to its source the slightest urinary hemorrhage. When under treatment the case must be watched over a period of several months or longer, as conditions warrant.

From a review of the literature on this subject, the general consensus of opinion as to the treatment of the condition is as follows:

(1) For all superficial or pedunculated benign papillomata, direct intra-vesical fulguration or removal by means of the cautery gave by far the best results.

(2) For infiltrating, definitely malignant tumors, the radical removal of the area of the bladder wall involved was the only treatment which was followed by any satisfactory results.

(3) When the growth involves both ureters, Watson's operation of total cystectomy, with a primary operation for transplanting the ureters into the loins, gave the best results.

(4) Cystotomy and excision of the growth and treatment of the base with the actual cautery should be used only in hopeless cases as a palliative to relieve pain and hemorrhage.

In 1910, we first began the treatment of bladder tumors with radium. Since that time it has rapidly come into general use and occupies a most prominent position in the armamentarium of many large clinics. Our experience has proven that the best results are to be expected from one, two or perhaps three intensive treatments at an average interval of six weeks. To do this it is of course necessary to have at one's disposal a large amount of radium, as the following demonstrates:

From October, 1910, to May, 1922, 142 cases of carcinoma of the bladder have been treated with radium at the Howard A. Kelly Hospital. Of these, 55 were males and 82 females. The average age was 53 years. The youngest was 26 and the oldest 86 years of age. There were 140 white and 2 colored patients. In 51 cases the patients gave no other symptom than blood in the urine, the longest duration being 6 years and the shortest 2 months. In every case hematuria was a prominent symptom, and in every case it made its appearance early. There was a history of a definite chronic cystitis persisting from 2 to 20 years prior to symptoms of cancer in 17 cases. Palliation was obtained for a short time only or no improvement in 89 cases. In 53 cases there was definite improvement and relief of symptoms for a long time, or cures over a period of three years with no recurrence, as tabulated below:

(1) Cures over a period of three years or longer, 16.

(2) Remained well over a period of three years but died from some extraneous disease, 5.

(3) Clinical cures from two to twenty-eight months and still under observation, 8.

(4) Palliation from two to thirty-four months, with later recurrence or death, 24.

This gives a total of 14 per cent three-year cures with radium in an unselected class of cases. In fact, many of the cases were referred to us with recurrences following operation and a vast number of them were already in advanced stages of the disease.

Fortunately, vesical tumors give symptoms early and many cases come in at a stage when the cystoscope offers both a simple and as effective a route for radium therapy as does a suprapubic opening.

We have employed three different types of radium treatment, used either alone or in combination: (1) direct, intravesical, or

surface radiation; (2) implantation, or the insertion of tiny glass capillary points containing radium emanation into the growth; and (3) massive radiation at a distance from the exterior, using the sacral, perineal, suprapubic and vaginal portals.

In the fall of 1921, we first began the use of the open air cystoscope for the direct treatment of carcinoma of the male bladder, and had employed this same form of treatment in our female cases since 1915. Intravesical treatment is carried out in all growths confined to and around the neck of the bladder: papillomata, papillary carcinomata and infiltrating carcinomata of not over 4 c. c.

Growths other than these without evident metastasis, extensive infiltration of the bladder wall, large and multiple tumors and all doubtful cases, are submitted to a suprapubic section. The intravesical treatment is made through the Kelly or Greenberg open air cystoscope, with the radium encased in a brass capsule attached to the end of a straight sound and held against the tumor under direct vision. For each square centimeter of disease 100 milligram-hours radiation is the maximum dosage. Using an applicator containing 1200 millicuries, it would be necessary to hold the applicator but 5 minutes on each square centimeter to obtain the equivalent amount of radiation. In this way a tumor with a surface 3 cm. square would be given the maximum radiation through the cystoscope in a total of 15 minutes. By using a stronger applicator the actual time of exposure can, of course, be reduced. The entire treatment can be finished at one or two exposures. This amount of surface radiation should not be repeated under a period of six weeks.

With this type of radiation we are first able to determine the reaction to radium that the tumor will show, check the bleeding and treat effectively tumors which involve the vesical neck and internal urethral orifice. If the tumor is a definite infiltrating sessile carcinoma, we may then treat by the implantation technic, introducing small glass emanation points directly into the growth. We have determined that 0.5 millicuries of radium emanation is necessary to destroy 1 c. c. of tumor. These emanation points are implanted under direct vision through the open air cystoscope by means of an especially devised introducing instrument. In this way by having a number of these points ready, each threaded into an instrument, we can quickly and accurately introduce from 10 to 15 throughout the growth, the entire time consumed being from two to three minutes. The points, themselves, are left permanently to decay, giving off their maximum activity by the end of seven days but being slightly active for twenty-eight days. The action from this method is local and caustic. An intensive treatment such as this method affords should not be repeated under two and a half months. By inserting the points directly through the anterior vaginal wall, we are able with a fair degree of accuracy to implant tumors occupying the anterior bladder wall under guidance of palpation.

The suprapubic or incisional type of treatment is carried out in cases where there is no evident metastasis, in extensive infiltration of the bladder wall, large and multiple tumors, and in all cases where there is some existing doubt as to the exact amount of bladder involvement. The bladder wall is palpated before incising to avoid cutting through any growth. Then incision is made and the cut surface of the bladder is caught with Allis clamps. A self-retaining retractor is then introduced into the bladder cavity with open loops. This gives the advantage of making visible a portion of the bladder wall through the open blades of the retractor. An additional retractor in the form of a spatula is occasionally used behind the symphysis, but often is not necessary. Moist alcohol sponges are used to free the bladder of bloody urine, care being taken to prevent bleeding of the tumor and a possible spreading of tumor cells. If the tumor is large and definitely protruding, it is removed with the cautery and the base is cauterized to check bleeding. This permits of better exposure to the base and allows more effective treatment with radium. All of the areas of the tumor are then implanted, averaging a total dose of 0.5 millicuries to each cubic centimeter of growth, particular care being taken thoroughly to implant the margins. Supra-

pubic intravesical surface radiation is accomplished by means of multiple radium capsules, screened with 1 mm. brass and 1 mm. rubber, placed side by side over the surface and overlapping by 1 cm. the margin of the tumor, the number of capsules used depending upon the size of the growth. This applicator is held in place with the patient still on the operating table under anesthesia. For an area of approximately 3 square cm., 900 milligram-hours radiation is given. By using an applicator of 2000 milligrams strength, the treatment is completed in less than half an hour and the actual time can be further cut down by using a stronger applicator. This additional length of time does not add further risk to the operation. The closure is as usual, but for the comfort of the patient it is better to leave a drainage tube in the bladder for a minimum period of ten days. Bladder irrigations through the urethra should be started after the fifth day and the healing of the sinus is not prolonged over that of any suprapubic cystotomy.

We feel in all cases of bladder carcinoma that massive radiation from a distance is helpful. The suprapubic route is usually chosen as giving the closest approach, but the perineal and sacral routes may also be used, and in the case of females, the vaginal route. By using the external portals we frequently reach a total dosage of 30 to 40 gram-hours radiation.

DISCUSSION

Dr. J. T. Geraghty, Baltimore, Md.—Before one can successfully treat bladder tumors it is necessary to determine the nature and the position of the tumor. It has been our experience that the benign and malignant papillomata practically all respond to fulguration and that fulguration gives results that are incomparably superior to anything that surgery can afford for this type of tumor. One will find a certain group of malignant papillomata very resistant and slow in responding to fulguration. If these tumors, however, are given a small amount of radiation their response to fulguration is prompt. The malignant papillomata pass over into non-infiltrating superficial papillomatous carcinomata, which may occupy large areas of the bladder, or may be fairly well localized. Our best results in this type of case have been by the application of radium to the surface of the tumor through the urethra, and those tumors suitable for this form of treatment comprise about 15 per cent of all the tumors.

When the papillary carcinoma reaches the stage where it is infiltrating the bladder wall, surface applications of radium have, in our hands, been of very little value. We feel that when the infiltrating growth is sufficiently localized to permit of excision a radical resection should be done and the tumor removed with a wide margin of healthy tissue. However, where the tumors are multiple or when they are too extensive for resection, the implantation of radium will in a not inconsiderable number of cases give excellent results. Many of the tumors, while being broad based, are much larger on the surface than at the base. It is our custom to destroy the surface of the tumor with the cautery and then infiltrate the base with radium. In a series of fifteen cases we used the emanations, but recently we have tried small needles of the radium element. We do not feel that the amount of radium employed in any case should exceed 2500 mg. hours, as the injury to the bladder is too great. The insertion of emanations or radium needles through the cystoscope into the tumors is only suitable for a very limited number of cases. Recently in several rather hopeless and extensive infiltrating tumors of the bladder we have employed deep x-ray therapy. In one case the tumor, which was considered inoperable and too extensive for radium, disappeared entirely under the deep x-ray therapy. Our experience with this latter form of treatment, however, is too recent and limited to draw any conclusions.

Dr. William F. Braasch, Rochester, Minn.—Certain principles are generally recognized in the controversy with regard to the choice between surgery and radium in the treatment of tumors of the bladder. If the tumors are not extensive and can be removed completely, a wide resection is the indicated procedure. If they are small or situated so that radium can be applied through the cystoscope, such treatment should be given. We have largely abandoned resection of extensive tumors of the bladder necessitating reimplantation of the ureter, since the procedure has not always been successful and is accompanied by a high mortality. Suprapubic cystostomy and the implantation of radium emanations, according to the method of Dr. Barringer, has been substituted for surgical procedures. I consider this the greatest recent advance in the treatment of tumors of the bladder.

The percentage of recurrences in small papillomatous tumors removed by fulguration or radium is not so large among those that we have observed as Dr. Geraghty's data would indicate. It has been our experience that not more than 25 per cent of the patients observed with tumors of the bladder can be treated successfully by fulguration or a combination of fulguration and radium. In the remainder the tumors are of the solid type or are malignant papillomas which require resection or the introduction of intensive radium emanation.

I wish to bring up another point, that is the great value of the early diagnosis of tumors of the bladder. Although this has been emphasized repeatedly, it is surprising how many patients present themselves with all of the identifying symptoms who have been treated by physicians for

many months. It is evident that if the tumor is discovered in its early stage the possibility of cure is much greater by any of the therapeutic measures employed. Even malignant papillomas, when observed in the earliest stages, may be amenable to such simple cystoscopic procedures as fulguration and radium implantation. Every means should, therefore, be used to discover at once the cause of hematuria and urinary frequency, and the patient should be referred to a urologist for careful examination.

Dr. Edgar G. Ballenger, Atlanta, Ga.—We are all familiar with the difficulties of permanent drainage of the bladder in inoperable or recurrent carcinoma of the bladder and prostate gland. If the drainage tube is small, it is likely to become plugged with blood clots, while on the other hand if it is large it is unwieldy and produces more or less discomfort. During the past few years we have modified the method of dealing with these patients and the results have been quite satisfactory. Suture of the bladder to the abdominal wall is not necessary, but facilitates subsequently the introduction of the tube. The incision is closed in the usual manner and a one-half-inch tube is cut off so as to project about one-quarter inch above the skin. A very large safety pin is then passed through the outer part of the tube. A strip of sterile adhesive plaster with a hole in it is carried over the end of the tube and safety pin in such a manner as to hold the tube in place. Sterile vaseline or zinc ointment is smeared around the area of the incision. Then a large colostomy ring with a rubber sleeve over it is placed so that the ring does not press on the incision. The strap is adjusted around the back and tightened until comfortable. The urine is carried through a tube into a bottle by the bedside. Moving this tube or traction on it does not cause any discomfort because it is attached to the belt rather than to the tube in the bladder. All of the tubes are large and allow the passage of clots.

The device may be removed from time to time as indicated (two to seven days) and the tube in the bladder is then cleaned and boiled. Dakin's solution, argyrol or other medicaments may be injected as indicated through the outer tube or through a catheter passed into the bladder. If desired, radium may be applied through the incision, as the opening is kept rather large. Surprisingly little trouble is experienced in the management of malignant growths of the bladder or prostate by the plan above outlined. In fact, a nurse or orderly or a member of the patient's family can make the changes when necessary. It is not suitable for patients who are very thin or whose symphysis projects so as to prevent a smooth seating for the ring or a large colostomy device. The patient is kept dry when he is on his back, propped up in bed, in a wheel chair or walking around, but it is likely to leak when he is on his side.

Dr. H. W. E. Walther, New Orleans, La.—Dr. Neill's paper has emphasized the large doses of radium necessary in treating neoplasms of the bladder. Most surgeons work under the handicap of not having sufficient radium to benefit these cases. One gram is not enough. That dose does not control them, and until we get more radium in the South to handle these cases I do not see how we can hold out much hope to our patients or to our consultants and make much impression upon them.

Another point of great importance re-emphasized by Dr. Neill is the elasticity of radium emanation as compared to element. We need more radium emanation stations in the South. With these we could reach many more cases and do infinitely more good. In our work in New Orleans particularly we are constantly in need of emanation, and I feel that it is going to be forced upon those handling and owning radium to install an emanation apparatus in order to give our patients and us satisfaction in the therapy of this condition.

Dr. Neill (closing).—Referring to Dr. Geraghty's remarks in regard to radium and operation, I am not in favor of pre-operative radiation unless the operation is carried out not later than three or four days afterward. A further delay means that we will find marked irritation of the tissues, which are always friable and difficult to deal with, and the chances of a healing of the wound are not so good. In papillary carcinomata, the histological picture helps us little in a prognostic way. We have often found that of two tumors which give identical microscopic pictures the response to radium in one will be satisfactory, while in the other there will be no beneficial effect. In the far advanced and hopeless cases, heavy massive radiation from a distance to include the entire pelvis is often palliative.

EYE, EAR, NOSE AND THROAT

THE PROBLEM OF OBSCURE NOSE AND THROAT AFFECTIONS*

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One of the most perplexing problems confronting the average laryngologist is the accurate diagnosis and proper treatment of borderline or indefinite affections of the upper respiratory tract. Cases where the local pathological changes are insignificant in comparison to the systemic reactions produced.

Foci of infection frequently cannot be identified accurately by objective means, but present positive general symptoms of absorption in associated structures. It is these obscure affections which give us most concern and require extended study for accurate interpretation.

For the purpose of this discussion two general groups will be selected, attention being given to the unreliability of clinical changes and objective methods of examination, compared with the value of subjective and general symptoms in a final determination of the case.

The first group comprises indefinite infections of the accessory sinuses presenting minute or uncertain pathological changes in the intranasal structures, in contrast to the severity of systemic reactions manifested.

It is important to recognize these cases early, before toxic absorption has produced permanent tissue degeneration.

We have little difficulty in handling the usual run of sinus cases with destructive local changes and symptoms, but the borderline cases present a different proposition, for in these we must depend upon the reaction in remote structures for our positive information.

In making a diagnosis of any case, our conclusions are based upon the local pathology, objective impressions and systemic symptoms.

Roentgenography gives us valuable assistance in many of the usual sinus cases, but in this group the tissue changes are so slight that we may be misled by a negative report. Transillumination at best is unsatisfactory and cannot be depended upon for accurate diagnostic purposes. Tenderness over the sinuses is not a constant symptom and is generally absent in the low grade infections.

Bacteriological smears and cultures do not give us the desired information, because the upper respiratory tract is the natural habitation of many organisms, and it is difficult to say when an area is truly infected by this procedure.

We place most dependence upon examination of the intranasal structures for abnormal changes. But unfortunately in many of these cases it is impossible to determine the presence or absence of infection by the local appearance of the tissue. The nasal mucosa may seem to be normal, breathing space unobstructed, turbinates of regular size, with little change in nasal secretion, while the patient gives definite general symptoms of toxic absorption.

So if we must admit that the local changes are insufficient to establish a positive diagnosis and that the average methods of objective examination are unreliable in these cases, it is obvious that our final determination must be governed by a thorough study and understanding of the general subjective symptoms presented and the changes produced in associated structures.

As specialists, we are so accustomed to dealing with the local changes in our particular field that we frequently attach too much importance to the presence or absence of local pathology without due consideration to the many complicated reflex phenomena which frequently present the most reliable sources of information.

For this reason, it is essential to lay great stress upon thorough history taking. We should not be satisfied with the knowl-

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edge of intimate complaints involving the nose, throat and ear alone, but all remote symptoms indirectly produced in other structures must be given due consideration. With the average run of simple cases, it is very easy to form the habit of superficial history taking.

Complete physical examination will at times reveal the relationship of some obscure focal infection to an unsuspected organ. Closer cooperation with the internist is desired. The internist depends upon us in building up his diagnosis in obscure cases, but do we demand the same of him in our complicated nose and throat affections? No organ should be neglected in our survey. The eyes require special attention, for they are very sensitive to toxic reactions and frequently present the earliest symptoms of involvement. Such disturbances as photophobia, asthenopia, muscular weakness, defective vision, iritis, choroiditis, retinitis or neuritis may be our first warning of an insidious nasal infection without demonstrable changes in this structure.

A case in point was Mr. A, referred to me by an excellent oculist for nasal examination to determine the cause of persistent asthenopic symptoms which could not be relieved by refraction. This patient was unable to use his eyes for any great length of time. His eyes would burn, itch and tire quickly after reading, with headache and pains across the bridge of the nose.

After a very careful nasal examination I could not find sufficient evidence to say definitely that his trouble was coming from an infection in the nasal area. But considering the symptom complex, nasal treatment was instituted with gratifying results, for all symptoms quickly cleared up.

A second case of similar type was referred for the relief of a single symptom, intense photophobia, which could not be relieved by ophthalmological means. As before, my nasal examination was practically negative so far as clinical changes were concerned, but, profiting by previous experiences, intranasal treatment was given and in a short time the patient was well.

These cases were evidently low grade infections of the ethmoidal region and could have been easily overlooked if attention had been directed merely to the nasal region without consideration of the associated eye symptoms.

The general health of the patient should be investigated for remote indications of septic absorption. Malaise, sallow skin, loss of weight, nervousness, insomnia, gastro-intestinal disturbances, arthritic involvement, vascular changes, nephritic complications, infections of the respiratory tract, in short a complete physical survey, may result in the development of some symptom or group of symptoms which will guide us in the determination of these borderline affections.

At times general symptoms are so distinctive that attention may be entirely diverted from the primary focus of infection.

A striking case of this nature coming under my observation was a dentist who had been incapacitated for a year. He had the most severe group of general toxic symptoms I have ever seen. His skin was sallow and he was losing weight and unable to work. He had marked insomnia, was nervous and irritable with severe disturbances in his gastrointestinal tract. He had been treated for everything from neurasthenia to tuberculosis. At one time he had been referred to a rhinologist, who could find no cause for his infection, so he continued to take tonics and absorb toxins.

After taking his history I gave special attention to the nasal examination.

The local picture was not conclusive of an active infection, but there was a slight amount of this serous discharge from the right ethmoidal region and an x-ray report of slight haziness of the ethmoids on the right side.

Being influenced more by the general symptoms than by the intranasal findings, I determined to clean out thoroughly the right ethmoidal labyrinth, after which the patient began to improve steadily and was soon entirely well.

This patient has worked hard and constantly for the past two years without recurrence of any of his old symptoms.

The diagnosis of this case was missed by the first rhinologist because the local changes and symptoms were not sufficiently defined to produce a classical picture of sinus involvement.

It is very probable that I would have made the same mistake if I had not been impressed with the severity of the general symptoms and made special effort to discover the cause.

Headaches and pains are so constantly associated with sinus involvement that they are generally recognized and appreciated as important subjective signs, so that mere mention of them is necessary here. Likewise vertigo, nausea and vomiting are often indications of disturbance in this region.

There are many obscure reflex nasal phenomena which are as yet not well understood, and which present an interesting field for development in relation to these

indefinite affections. So that a thorough and scientific study of the many complicated and associated bodily reactions will not only prove helpful in solving the problems of the individual cases, but will add to and broaden the knowledge in our specialty.

The second group of cases will be very briefly considered, for they have general features in common with those mentioned.

This class includes chronic infections of the tonsillar tissue with little demonstrable evidence of local involvement. The tonsils are often small and submerged, with few crypts. There may be no enlargement or tenderness of the cervical glands, yet general symptoms clearly indicate that absorption is going on in this vicinity.

In these cases it is easy to form erroneous conclusions if we are readily influenced by the local picture and do not make a careful investigation of every possible general symptom before a final opinion is rendered.

Only recently a case was referred to me with a request that the tonsils be removed as a most likely cause of acute nephritis. From their appearance, no one would have said that the tonsils were abnormal, but after their removal all symptoms of nephritis cleared up.

Another case, a medical student, developed a severe hemorrhagic retinitis. A most thorough examination was made to determine the cause. All tests were negative. In his history he admitted having occasional attacks of sore throat, but the appearance of his tonsils did not indicate infection. As a last resort his tonsils were removed and in a few weeks the hemorrhages had cleared up, vision had returned to normal and he has had no recurrence of his eye symptoms since operation over three years ago.

Other cases with similar characteristics could be mentioned, but the type is familiar to all of you.

The cases presented are merely to emphasize the fact that it is important to recognize focal infections in the upper respiratory tract at the earliest possible time, before toxic absorption has produced permanent degenerative changes.

As many of these cases are difficult to determine on account of indefinite local pathology, we must be governed in our final opinion by a careful study of the general symptoms and the reaction in remote structures.

For this reason a very careful history is necessary. Complete physical examinations are important. Investigation of eye symptoms and changes in other organs may lead to the development of factors which prove to be the deciding element in a final analysis of the case.

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DISCUSSION

Dr. W. E. Driver, Norfolk, Va.—These conditions of the nose such as polyps and diseased ethmoid may manifest themselves remotely and in a general way, such as asthma. We have been able to demonstrate in a case of asthma, thought to be of an anaphylactic condition in the class cited by Dr. Townsend in his paper, definite changes spoken of by Widal as the hemoclasic crisis, that is a fall of blood pressure, an increased coagulability of the blood, a decrease of the white corpuscles, and a lessening of the index refraction of the serum. As this crisis passes, the asthma manifests itself. So we cannot study these cases from the general standpoint too closely. It seems important to have a dentist, an internist, and a serologist at one's disposal, but, as this is not often practical, it becomes necessary to study these cases ourselves in order to know how to treat them.

Dr. R. G. Reaves, Knoxville, Tenn.—The Doctor's paper is entertaining and timely, but the trouble is he has still left us with the problem. The truth is that we are all up against it in the borderline cases. We have patients whom we feel are absorbing toxin from somewhere, but from where does it come? Perhaps it is the tonsils. We feel pretty strongly it is the tonsils. The tonsils are not enlarged and there is little congestion; but we do know that sometimes we take such tonsils out and secure wonderfully beneficial results, while at other times we do not. If the tonsils are enlarged, we feel they ought to come out. A patient may come in with an antrum filled with pus. That is easy to diagnose. But it is the borderline cases that give us the trouble.

The most important thing is a careful examination. I have never used an arc light, but I do use a Holmes nasopharyngoscope, and I do not feel I can thoroughly examine a nose without that instrument, because it reveals things the x-ray will not. I can look in other than direct line of vision and I do not feel that I have given a patient a careful examination unless I have used that instrument.

I would like to mention a case, a patient who had been having typical headaches from irritation of Meckel's ganglion. The teeth had been extracted and the tonsils had been removed. She had a post-nasal discharge and headache, occipital and parietal, and pain about the left ear. With the Holmes nasopharyngoscope I could see definitely an edema of the mucous membrane up in the posterior ethmoidal region, and from that I took my cue and advised the patient what to have done. But I treated her and gave her some relief for about six or eight months. Finally

she decided to have an operation. I had an x-ray made, which showed some hyperplastic conditions of the left ethmoid. I did a complete sinus operation, which I believe is the safest in these cases, and the patient got relief almost immediately. I did the operation about three months ago. She has gained fifteen pounds and is another woman. I found no pus, but there was an edematous condition of the mucous membrane.

Another case, one of arthritis, was sent to me to search for focal infection. She had a postnasal discharge, no headache, but she had a history of antrum trouble on the left side. The x-ray showed more trouble on the right side than on the left, but putting the history and all together I operated upon the left side. I found no pus, but I found congestion and hyperplasia of the bone. That was about a year ago. I saw her the other day and found the operative field clear. There is no discharge, and the arthritis has disappeared. In these cases I was successful in making a proper diagnosis, but I still have borderline cases where I have a problem of diagnosis that is difficult to solve.

Dr. Homer Dupuy, New Orleans, La.—I enjoy the privilege of teaching post-graduate students. The question is often put to me in regard to the suspected tonsils. In the presence of a local picture in which there is no enlargement of the tonsils proper, no apparent secretion or debris obtained from the follicles of the tonsil, and yet in which the history is that of polyarthritis or some other end infection. Every field has been investigated with negative results, and the burden of proof finally comes to the throat man. My students want to know, in the face of this apparently negative picture of the tonsils, whether there is any one sign by which we can put the onus on the tonsil. Even though the tonsil be not enlarged, even though the follicles secrete apparently no pus, even though they are the submerged type and appear not off-colored, if a deep red areola surrounds the tonsils, covering the anterior pillars, the posterior pillar, this distinct red areola surrounding the tonsil means pathologic tonsils.

You may be doubting Thomases. But I am giving you the facts as I have seen them, and I wonder if you have been impressed with this deep red areola surrounding the tonsils as showing unquestionably that the tonsils are diseased?

Dr. M. M. Stapler, Macon, Ga.—Probably one other hidden local pathological condition should be mentioned. I refer to aborted wisdom teeth. There may be no disease of these teeth *per se*, but their abnormal position is sometimes the cause of disturbances. Let us not forget them when we are looking for hidden local pathological causes.

In working out these obscure cases I think one should be careful about making positive statements as to the immediate results, for we are now beginning to get a broader conception of focal infection in that we do not expect to clear up all suspected cases by removing diseased teeth and tonsils.

Many people come to us about the time they are reaching the evening of life complaining of symptoms that may direct our attention to the paranasal sinuses as foci infection. In such cases the infection may have been present for years with repeated acute exacerbations, and it is after one of these acute attacks that we stand the best chance of getting the desired information from an x-ray.

The tonsils should be removed in any proven case of chronic sinus infection. In real cases of pyorrhea, the tonsils should be removed before dealing with the teeth.

Dr. Looper (closing).—In many of the low-grade focal infections of the nose and throat our conclusions must be formed principally by the character of general symptoms presented, as the local tissue changes are uncertain. For this reason a thorough physical examination in all borderline cases is necessary.

It is important to determine and eliminate infection as early as possible, before advanced pathological changes have been produced. Often some remote systemic symptom will be our first warning that toxic absorption is taking place. Hence, careful study of every organ should be made in all obscure cases.

DIRECT INTUBATION IN NEGLECTED AND DESPERATE CASES OF TRACHEAL AND BRONCHIAL DIPHTHERIA*

By Clyde E. Purcell, M.D.,
Paducah, Ky.

It is the purpose of this paper to discuss the remarkable advantages of direct intubation and bronchoscopy in dealing with respiratory obstructions due to laryngeal, tracheal and bronchial diphtheritic involvement. It is also our purpose to explain the causes of these advantages and to suggest wherein we may, in these desperate and neglected cases, gain new results and add a new weapon against these inspiratory difficulties. These deductions are based upon two experiences in the removal of membranous obstructions from the bronchi in connection with conclusions based upon experiences in ten direct intubations.

It might be well at this particular time to emphasize that this small series of cases is not sufficient to draw a permanent conclusion; but since there have been so few attempts, so far as the writer knows, at removal of membranous obstructions from the bronchi, it may not be out of

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place to report these two instances. Also, the conclusions arrived at in managing these ten cases of direct intubation are convincing enough in the writer's mind of the superior value of direct intubation and the hope of wonderful achievement by its use if carefully carried out.

During the past two years I have had two experiences with diphtheritic obstructions of the bronchi.

One case I reported in the *Laryngoscope* for September, 1921. An emergency tracheotomy was necessary to get the child into the hospital alive. Later, difficulty in breathing was developed, and the tracheal tube was removed, cleaned and reintroduced with no improvement in breathing. The situation seemed hopeless. I did not then know a membrane could be removed by means of the bronchoscope. As there was no other chance or hope of relieving the child, the family physician agreed with me to pass the bronchoscope in order, if possible, to find out the cause of the labored breathing. Both bronchi were practically closed by membranes which were a dirty gray color. I lost no time in removing them with forceps through the bronchoscope. Immediately there was relief from difficult breathing and the child soon fell asleep with apparently unimpaired respiration. Unfortunately, these obstructions reformed and we were compelled to remove them repeatedly, probably ten or a dozen times. This is the only instance in which I have worked through a tracheal wound. It is no easier than through the mouth. This is in accord with the conclusions of one of the best bronchoscopists in America or Europe. Large doses of diphtheritic antitoxin were given until 150,000 units were administered. After the membranes in the bronchi stopped forming, the child made a quick recovery. Originally, no doubt, this was a case of laryngeal diphtheritic stenosis, bronchial diphtheria developing later. It is interesting to relate that at no time were there symptoms of shock or exhaustion. The child has remained well since its recovery, nearly two years ago.

In the second case, a child twenty months old, an intubation tube had been placed by the direct method with no anesthesia and no bleeding, which was a positive proof of no trauma. There was immediate relief from suffocation. All went well until the second day, when the nurse telephoned that the child was beginning to fight for air. At once I suspected extension of the stenosis into the bronchi and made preparation to pass the bronchoscope. When I reached the hospital the nurse informed me that the child was worse and that in her absence from the room for a moment the child had, in its struggles and efforts to get air, grasped the silk cord which was fastened to the cheek and had withdrawn the tube. However, this did not make matters better or worse. The mother, who was present, was asked to watch the child when the nurse had to leave the room and prevent its grabbing the cord and doing exactly what we wanted it not to do. As I was prepared to do a bronchoscopy, I passed the tube at once to the bifurcation and found an obstructing membrane in the right bronchus, which was immediately removed with forceps through the bronchoscope. This established perfectly free breathing. The intubation tube was again introduced and the child made a prompt recovery. It goes without saying, of course, that antitoxin was given in large doses.

For a long time I have felt that the palpation, or so-called blind method of intubation, could not be accurate and free from dangers. This has precipitated many debates in medical societies on the relative merits of intubation and tracheotomy. I do not desire to revive this discussion. However, my own conviction was that intubation by palpation or the O'Dwyer method was, on account of the unavoidable trauma to the larynx and the consequent complications arising from these injuries, less desirable than tracheotomy. Therefore, it was my custom, at that time to advise tracheotomy. With the advent of direct laryngoscopy, it became apparent that intubation tubes could be introduced with great accuracy and without trauma. In 1910, while in bed from an operation, I mentioned to a physician an instrument I had in mind for directly placing the intubation tube. However, I never attempted to carry this idea out. I did, though, on several occasions place intubation tubes in position by means of the Jackson direct laryngoscope and alligator forceps. This method had the difficulty of the tongue's being in the way, since the slide had to be taken off the laryngoscope and then, too, one did not have the tilting action necessary to raise the tube after it had passed over the tongue into the larynx. This difficulty was overcome by catching the tube so as to place it at an angle of 35 degrees above the shaft of the alligator forceps.

When Mosher brought out his instruments for direct intubation he solved all these difficulties. Alligator forceps through a direct laryngoscope may be used very readily to remove the tube. Tube and forceps may be withdrawn together after the tube has been grasped with forceps. The writer used this method on one occasion before Mosher brought out his instruments to extubate in a patient where my predecessor had failed to remove a tube which had been very accurately placed by

the blind method. It was gratifying to have the patient's parents comment at this time upon the absence of bleeding, which, they said, was profuse at time of intubation and also at the time of attempted extubation.

In no case was it necessary to leave the tube in for more than a week. There were no chronic tube cases as we used to have by the palpation method. Absence of trauma at time of intubation must have been a factor in preventing laryngeal constriction. Direct intubation has the disadvantage that it cannot be performed except by those skilled in bronchoscopy. In order to show the necessity of hospital care and attention, it is thought advisable to report two cases. The first, which is an average case, is as follows:

A child, four years old, developed laryngeal diphtheritic stenosis and was seen by the family physician early in the morning after the stenosis had become evident to the parents. The physician at once administered 20,000 units of antitoxin which did not immediately relieve the stenosis. The patient was sent to the Isolation Hospital and the writer was asked to place an intubation tube, which relieved the stenosis immediately. Diphtheritic sloughing was present everywhere in the throat of this child. Large doses of antitoxin were at once started and 175,000 units in all were given. In five days the child was apparently normal. We were unable to get the parents to keep this child in the hospital longer; they felt they could care for it at home just as well. At that time it was breathing freely; pulse, temperature and respirations were normal, and it was fretting for something to eat. When the child left the hospital the parents were cautioned to feed it only liquid nourishment. Two days later the patient was so insistent for something to eat that the mother gave it a biscuit and a piece of meat. A little later the writer was hurriedly called to see the youngster, and on his arrival at the house the patient was dead. No doubt the piece of meat lodged in the intubation tube. As this child was perfectly normal in every way when it left the hospital, there can be no blame attached to the method of intubation.

The last case was that of a child two years old, who was seen by the family physician and a diagnosis of laryngeal diphtheria made. The patient was sent in to the Isolation Hospital and the writer was asked to do an intubation. The diphtheritic involvement was all in the larynx and a tube was placed by the direct method. In a few seconds the child greatly improved. Antitoxin was given in large doses. Nursing was carefully carried out. The tube was removed at the end of seven days and the child left for home twelve hours later. It has remained perfectly well since.

These desperate and neglected cases are the ones usually that have no physician. People wait until the child is almost dead before they call the family physician and laryngeal stenosis has already made its appearance and has caused the parents to seek professional aid from the family physician. Fortunately, as time goes on, there are fewer occasions for intubation. With the widespread knowledge of the value of antitoxin administered early, in the future there will be few occasions to observe the complications of diphtheritic involvement. In the cases that have come to the writer's attention, no blame could be laid at the door of the family physician for not having administered the antitoxin early. In most cases the writer has seen these cases about as early as the family physician.

My present conviction is that with the two weapons at hand, namely, direct intubation and bronchoscopy, we can practically eliminate tracheotomy in the management of diphtheritic stenoses. Everyone who has had experience with tracheotomized patients knows that it requires very skilled nursing to take care of them. However, intubation cases with ordinary nursing are not such a problem. It must not be understood from what I have tried to say that this is a panacea for diphtheritic stenotic complications. I do feel, however, that if a patient has no lung complications, no kidney involvement, and is not profoundly septic from absorption of toxins, that the two means we have at hand, together with massive doses of antitoxin, ought to save a great majority of them. In fact, I have been able, so far, to save every one of my own. In other words, it strikes me that we ought to be able to handle successfully all cases of diphtheritic stenoses whatever their character, whether they be laryngeal, tracheal or bronchial, or all combined.

DISCUSSION

Dr. A. E. Goodloe, Chattanooga, Tenn.—No matter how proficient and expert one may be in doing the blind method, there are certain things that one cannot know about the condition of the larynx which can easily be seen and ascertained by the direct. One is that it cannot be known when a tube is inserted with difficulty whether this difficulty is caused by edema or by a spasmodic condition, and it is the tendency to use

more force when the tube is to be inserted in the larynx than there would be were one looking into it. The advantages are analogous to the gynecologist when he makes a digital examination of the cervix uteri and then inserts a vaginal speculum and looks at it.

There are cases where diphtheria has been superimposed upon a previous inflammation of the larynx due to a foreign body, such as a nut hull, a pin, or other object. Here we would probably get both the clinical manifestations and the laboratory diagnosis of diphtheria and would feel perfectly safe in giving the regular treatment, little suspecting anything else until the patient's failure to recover points to some complication. This condition would most likely be seen at a glance upon the insertion of the laryngeal speculum and could be removed.

It must be remembered that in some of these cases minutes—and even seconds—make that small margin between life and death, and the operator should choose that method which insures air to the lungs in the quickest time possible, and the one that is most free from accidents and dangers. I believe the direct offers us those qualifications.

It has been argued that there is likely to be more trauma produced by the manipulation of the speculum than there would be by palpation. This sounds very well, but we must remember that the operation is not finished by palpation, but that the end of the tube is being forced against the cords and would be at least as likely to produce traumatism as would the smooth-ended speculum manipulated under the guidance of the eye.

I understood from the Doctor's paper that the child in his second case lost its life from the pulling of the tube out of the larynx by the attached string. I do not know whether or not he leaves the string in all of his cases, but if he does I believe the removal of the string to be better. It annoys the child much and there is always a certain amount of danger of its being pulled out. If the tube is properly fitted I can see no reason in leaving the string in.

So far as I know, Dr. Purcell is the first man to report the removal of bronchial casts from the bronchi in diphtheria through the bronchoscope, and of course this is encouraging. His having to remove them so many times in the same case and the failure to clear them up after the repeated administration of such large doses of antitoxin, is most interesting, and it is unfortunate that he did not have the laboratory findings to back up his diagnosis, if nothing more than to prevent criticism in the future of this most unusual case.

Dr. Homer J. Dupuy, New Orleans, La.—As a matter of historical record, we should not forget that the lamented Dr. Lynah, of New York, ten years ago reported a series of thirty or more cases of tracheo-bronchial diphtheria, in which he diagnosed the disease through a bronchoscope and removed membrane through the bronchoscope. This work is so monumental in character that it must not escape our attention.

I do not believe the direct method is advisable as one of selection. I do not believe that the indirect method in the hands of an experienced and accomplished intubationist is the cause of traumatism. We have chronic tube cases, that is true, but the trauma is produced not so much by the primary insertion of the tube as in some instances by the long contact of the tube with the parts. In other words, it is not so much a question of intubation *per se*, but a question of how long the tube must remain in the larynx. There is also subglottic laryngitis resulting in hyperplastic changes below the larynx which also account for a chronic tube case. From my experience in the Charity Hospital, where we have ample material for intubation, I believe that as a whole indirect intubation in the hands of an experienced intubator is more quickly done than by the direct method. Marked dsypnea calls for immediate help, and by the time you get your suspension apparatus working, and overcome the mechanical difficulties which lie in your pathway, no matter how accomplished you are in the art of suspension, I think there will be too much waste of precious time.

Dr. Purcell (closing).—I am glad to know that this has been done before. I told Dr. Goodloe that I had written the *Laryngoscope* and the *Journal of the American Medical Association* in order to get all the literature bearing upon the subject, but they said they had none. I am glad to know that Dr. Lynah had already succeeded in doing this. At any rate, it is worth while calling attention again to the fact that we have an efficient means of removing these obstructions from the air passages.

Chronic tube cases have been mentioned and it might be said in that connection that the reason for the chronic tube case is the primary injury to the larynx. That is the old charge against the indirect method—inevitable trauma of the larynx. Suspension has been mentioned in this discussion. We would think it a great drawback in placing the tube by sight in that it would be an unnecessary addition to the equipment.

MEDICAL EDUCATION

THE TEACHING OF PHYSICAL DIAGNOSIS AND ITS POSITION IN THE CURRICULUM*

By I. I. Lemann, M.D.,
New Orleans, La.

The pedagogics of the medical curriculum has properly and logically become of increasing importance. Conferences such as this are devoting more time to the rearrangement of the curriculum, the redistribution of the hours and the consideration of the fundamental principles of teaching, and less attention to the introduction of new subjects, no matter how meritorious, into the already crowded schedule. It is no longer simply a question of how much and how detailed information we may pour into the student mind, for that conception of the function of the medical school can go no further. The *reductio ad absurdum* has been reached. The limit of hours and minutes cannot be indefinitely stretched. Dr. Roy Lyman Wilbur has succinctly stated the problem in his address before the last Annual Conference on Medicine, Education, Licensure, Public Health and Hospitals:

"The development of the power of observation and of rapid honest, unbiased reasoning based on ascertained facts, is the specific problem before the medical student. . . . The fundamentals with which they must concern themselves [students] are: (1) sound basic training in methods of thought, memory and honest reasoning; (2) the ability to observe; (3) the ability to use books and the tools of the profession; (4) the retention of a sound body with acute trained senses; and (5) the mental accumulation of essential facts immediately available for use."

There is no place in the curriculum where the constant application of these principles is more important than in the course in physical diagnosis. It is at once the basis of all future clinical training and experience, and the first point of contact with medicine as an art. Too commonly there is a chasm between the fundamental branches and the clinical subjects, a physical chasm represented by miles of separation between the university campus and the hospital and a mental, an intellectual chasm caused by the pedagogic failure not only to bring into contact and correlation the facts of anatomy, physiology and pathology with the data obtained at the bedside, but also to bring over into the clinic the scientific spirit of independent investigation typified by the laboratory. The teacher of physical diagnosis must give consideration, therefore, to three main things: (1) the method of his course; (2) its correlation with other parts of the curriculum; and (3) its content.

For many years it has seemed to me that the prime difficulty in teaching physical diagnosis lay in the raw material before us, i. e., the student mind, or rather in the inadequate and improper preparation of that raw material. We have had to spend an undue portion of our limited time in cultivating a spirit of independent investigation and scientific curiosity. There has been always on the part of the student a too great readiness to be shown and too great willingness to accept without question the intellectual pabulum offered. The prime difficulty is due most of all to the faulty training in primary and secondary schools. The inertia there acquired is not overcome by the routine of college laboratory and the perfunctory performance of set experiments. Nor do the college and professional schools attempt adequately to overcome the difficulty set before them. Not sufficient emphasis is laid upon the training of the mind and upon the correlation of acquired facts, and too much upon the acquisition of those facts. This attitude of mind should have been so thoroughly prepared and cultivated that it has become instinctive by the time the student has reached his course in physical diagnosis. The teacher of physical diagnosis has the responsibility of its further development and two further responsibilities, namely, that of training the eye, finger and ear in new methods, and that of introducing the student to the art of medicine.

For at the very onset the embryo doctor must be impressed with the fact that there is an art as well as a science of medicine

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although ideally the two blend thoroughly one into the other. The student is no longer to deal with inanimate or inarticulate things nor animals of a lower order. He is to consider his approach and his relation to a fellow human, to appreciate that the ultimate reason for the calm, dispassionate investigation of the physical make-up and functioning of his subject is the relief of his suffering. His "subject" is now a "patient," that is literally "one suffering." In such a spirit of research, then, and of proper personal bedside conduct, must the course in physical diagnosis be conceived and carried out.

Many of the methods of the laboratory may be adapted and many analogies developed. First there must be a demonstration of the methods to be employed and a discussion of the fundamental principles of physics which permit the evaluation of the data obtained by these methods. Then come, in logical sequence, the establishment of standards of normal and the labeling of the abnormal. Each patient is to be regarded as a new problem to be solved as one solves an unknown solution in the chemical laboratory, applying the various tests of inspection, palpation, percussion and auscultation as one applies the various tests at the chemical bench. There is constant need for correlating clinical phenomena not only with physical but also with anatomical, physiological and pathological data.

In our school it has been the custom to give in the third trimester of the second year a preliminary course in physical diagnosis, indicating the methods to be used and establishing the normal. For this the students practice upon one another. There is no discussion of abnormalities. Physical diagnosis proper is taught in the third year in small sections of about fifteen students, each section being taught by at least two, and usually three, instructors. This averages, then, about five students per instructor. Because of our abundant indoor service which provides amply for our senior students and leaves an abundance for the juniors we have preferred to give the physical diagnosis in the wards rather than in the out-patient department as is usual in most schools. This indoor service permits a better adaptation of the laboratory method. Two students are assigned to a patient and the instructors move from bed to bed, assisting, quizzing, elucidating and stimulating. When a group of two students have completed their examination of a patient they turn to an instructor to have their findings checked up and to undergo a quiz upon the interpretation of their findings. A record is kept of the grade obtained and also of the type of case. Each student's card at the end of the course shows the number and type of cases he has seen and we try to distribute the cases so that each student's experience is sufficiently varied.

We think the ward preferable to the out-clinic not only because of the ease of adaptation of laboratory methods, but also because of the possibility of continuing the examination beyond one period. It has, however, the disadvantage that the students do not work as rapidly as they would be forced to in the clinic. Incidental and corrollary to the routine outlined the instructors assemble multiple groups, say four or six students, for brief demonstrations and labeling of abnormal conditions. We say, for example: "Come here and listen to these crepitant rales." "Feel this thrill." "Here is a capillary pulse to be seen." Likewise we send successive pairs of students from their own patient to be shown another patient by other students whose patients have typical abnormalities.

It is not always easy to make sure that the student is observing the same thing as the instructor. Just as in the laboratories of anatomy and pathology the student is required to make a drawing or diagram of what he sees, not only to make a record but also to insure his understanding, so in the clinic this might be used to a limited extent. It is particularly difficult to know that each and every student is hearing the same sounds we are hearing and this difficulty is not always or entirely obviated by the multiple stethoscope. A description of the sound by the student is helpful, as is also a comparison of it to some other well-known sound (rubbing of hair, gallop, whistle, snore). But most helpful, it seems to me, is the requirement that the student imitate or reproduce it by sounds made with mouth or hands, etc. Such a reproduction of the thing heard is analogous to

the reproduction by drawing of the thing seen. However, students are not easily persuaded to try it.

In addition to establishing "normals" and labeling abnormals, schemata are indicated for the analysis of phenomena. For example, respiratory types are analyzed as to pitch, intensity, quality and relative duration of inspiration and expiration. Heart murmurs are analyzed as to the time of their occurrence and the area of their maximum intensity.

The problem of correlating the course with physics, anatomy, physiology and pathology we attempt to cover in an amphitheater demonstration once a week, to which the whole junior class comes. A patient is shown and a student is called down to demonstrate and report to the class what he may observe. Preference is given to cases which present phenomena apparent to all on the benches, but this is not exclusively the case. A running quiz of the student in the pit and also of the entire class is developed. In these assemblies a general discussion is provoked of such topics as the explanation of the production of rales, of varying degrees of resonance and fremitus under different pathological conditions, of the cause of orthopnea, dyspnea, edema; arrythmias, their classification and methods of their identification by bedside methods without instruments of precision, etc.

Reference has been made already to the position of the physical diagnosis course in the curriculum. In the days before the concentration of the pre-clinical subjects, I was introduced at once to the study of physical diagnosis coincidently with that of anatomy and physiology. My colleagues and I knew hardly more than the existence of heart, lungs and liver and our notions of their location were quite dim. Much vaguer still were our ideas as to diseased conditions that might occur in these organs. It is true that we gained something in point of time and something, too, in the immediate interest in all things medical which is lost to some extent in the detached attitude incident to the isolation of the fundamental branches. We did not, however, have the fundamental knowledge necessary to correct judgment of the things we were shown. Some have begun to agitate for the return of the former method and to insist upon the desirability of the student's association with things medical from the earliest point in his course. I have seen both methods tried and with all its weaknesses I prefer the present to the former one. An adaptation can possibly be made, but it seems to me that that adaptation cannot possibly precede some knowledge of anatomy and physiology; in other words, that the student's contact with things medical cannot be profitable before the latter part of the second year.

Finally, we must consider the content of the course. For the sake of information we might wish it to be as extensive, as varied as possible; for the sake of thoroughness it must be intensive. It seems to me that the latter consideration must have priority; that repetition and drill in methods is more important than the variety of experiences and accumulation of knowledge of comparatively unusual conditions. The student must have indeed "the mental accumulation of essential facts immediately available for use" which Dr. Wilbur has set down as fundamental, but we cannot and ought not to make any pretense of extending that accumulation beyond a reasonable average in the space of our course. The latter cannot be expected to be all-comprehensive. It can merely set forth the usual and ordinary and frequent with perhaps now and then the exhibition of an unusual or curious case as a bit of spice as a stimulant to the interest and imagination of the student. After all, we return in summary to the fundamental idea that all we can do is to train the student. We must acquire his own experience and his own information.

DISCUSSION

Dr. Charles L. Minor, Asheville, N. C.—The subject is very important and interests me because I am in position to judge somewhat of the success of instruction in physical diagnosis in this Country. In the twenty-eight years I have worked in a resort I have of course had a great many cases sent me by all sorts of men. At all times I see a great deal of careful work, and some careless work, but I am perfectly satisfied that the average work that is being done in physical diagnosis in the United States today is far better than it was twenty years ago and is definitely on the up-grade. Mistakes are fewer and reports of findings are more accurate.

One of the things we find lacking in the teaching of physical diagnosis is a proper system, a definite routine. We all know that routine, if he is not careful and follows it slavishly, can ruin a man's work, but without a satisfactory routine he is bound to fall into error. The average student or young physician does not follow a routine. He takes some of the steps of a physical diagnosis and leaves the other alone; and yet one small step, in itself perhaps not very important, may give us the final point by which we can make a correct diagnosis. Take the matter of proper inspection, one of the very most important things. I am sure that those who teach will agree that in most cases the inspection is so slight and careless as to be made of no value at all.

I would speak also of another difficulty. Personally, I find that I cannot make a satisfactory examination of a patient lying in bed. To do thorough and satisfactory work I want my patient sitting up. I think so far as it is possible the student should work on the erect patient first, before he comes to the patient who is lying down.

Another thing that is neglected is a very careful mapping out of organs. That is very often omitted. Mapping the lower border of the lungs, mapping out the heart—all the various organs—has an anatomical as well as a diagnostic value, but I think it is often neglected.

Physical diagnosis is a question of great delicacy and care, extremely careful observation, notation, and then a logical correlation of findings. But, after all, the essence of success in physical diagnosis, outside of common sense, is a systematic and intelligent following of careful routine, from which we deduce the truth.

Dr. Louis Hamman, Baltimore, Md.—After all, physical diagnosis is the ground work of our professional activities. It will profit a man nothing to have the most detailed information about the natural history of disease provided he cannot rely absolutely upon the information he gets by means of physical diagnosis. If the facts upon which he bases his reasoning are wrong, then certainly his conclusion must be equally wrong. The method that has been used at the Johns Hopkins Hospital for a number of years is to give the second year students a preliminary course in physical diagnosis. They are taught the fundamental principles of percussion and auscultation and the technic used in the practice of these arts. In the third year the students study patients in groups of five or six. It is the object of this instruction to allow the students to do the work themselves and the instructor is there simply to help them over difficult places. In this course in physical diagnosis the students should learn to appreciate physical signs and to draw correct conclusions from them. However, it is not a part of the course to teach them the clinical course of disease. The important thing is that they appreciate the signs that are present and that they understand their significance as far as the physical condition of the organs causing the signs is concerned.

I agree with Dr. Minor as to the great advantage of having a patient sitting up in examining the lungs. I myself never feel altogether safe in my conclusions about the condition of the lungs if I must make the examination on a patient lying in bed. Gross lesions are easily detected, but I think it is difficult to be sure about the slighter changes.

I think at times too much emphasis is placed upon the terms that are used to designate the findings of percussion and auscultation. I need only remind you of the varying terminology applied to rales. The important thing is for the student to appreciate clearly and to be able to describe accurately what is seen and felt and heard. I believe at the beginning of physical diagnosis it is a distinct disadvantage to use specific terms. Students should be encouraged to tell what they observe in their own words without using such specific terms as thrills, crepitant rales, presystolic murmur, and so on. If they describe accurately what they observe and then try to infer from this observation what changes have occurred in the organs, they will have a clearer conception of the use and value of percussion and auscultation than if they describe their observation in terms that have an accepted implication. Nor do I feel that students should spend too much time in the examination of normal persons. It is important for them to do this to acquire the technic of percussion and auscultation. But, after all, what we consider normal is in contrast with the abnormal. In order to emphasize that part of the normal which it is important for the student to recognize as normal, it must be contrasted with the abnormal. No student would be able to make this important contrast from examining normal persons alone.

Dr. Frank K. Boland, Atlanta, Ga.—So far we have spoken of physical diagnosis as it relates to medical conditions, especially of the chest. I think it is well also to remember its importance in surgical conditions, especially of the abdomen. No one method of diagnosis is so important to my mind as the method of physical diagnosis. It far excels any method of the laboratory, and for this reason this subject should be well taught and an adequate number of hours given to it in the curriculum. I have noticed in some instances a tendency to turn this important subject over to young men; but I think that is a mistake. I feel, on account of the importance of this subject, that it should be handled by men not only of ability but of vast experience. I do not think a man can handle this subject well unless he has years of experience back of him.

Another point I want to make is that if this subject is not well grounded into the student at the time of his clinical work he will always be faulty in his diagnosis. If he gets good ground work in physical diagnosis in the latter part of his second year, as Dr. Lemann mentioned, it will always stand him in good stead. If he does not get the principles well grounded at that time he will always be shy on physical diagnosis.

Dr. Robert Wilson, Jr., Charleston, S. C.—I agree with Dr. Lemann that the proper place to teach physical diagnosis is in the wards. We have been using the wards for teaching physical diagnosis, and not the out-patient department, for several years, and I am confident that we get better results.

The time to begin the teaching of physical diagnosis is a mooted question. We begin in the second half of the second year and, as Dr. Lemann has said, there is a tendency now to begin even earlier. One of the weaknesses in our method of instruction is a lack of correlation between the departments of anatomy and physiology and the clinical departments. Students so often find in taking up the study of physical diagnosis that they have forgotten a great deal of their anatomy and physiology, which I believe would not be the case if these subjects were not taught in complete dissociation from the clinical subjects. The departments of anatomy and physiology could use advantageously the material in the wards for demonstrating anatomy and illustrating physiological conditions.

I am in accord with Dr. Minor and Dr. Hamman in saying that the upright position is more satisfactory than the recumbent in making physical examinations of the chest. In my own practice I usually have the patient in a sitting position unless he is too ill.

I was glad to hear Dr. Boland point out that physical diagnosis should not be confined to the chest, but should include the entire body. There has been too much of a tendency to designate physical diagnosis as meaning only examination of the heart and lungs.

Dr. W. McKim Marriott, St. Louis, Mo.—In the teaching of physical diagnosis it is important to realize that physical signs are different in children from those in adults. What may be normal in an adult is abnormal in a child, or vice versa. A student has not really learned physical diagnosis until he knows it on both adults and children, and this should be taken into consideration in any course in physical diagnosis.

In the Washington University School of Medicine we adopted some years ago the plan of teaching physical diagnosis to students in two parts, one part with adults and the other part in the same year with children.

Dr. Lemann (closing).—The real thesis I wish to present is that the teaching of physical diagnosis, as the teaching of other branches of medicine, should be a matter of scientific pedagogy. We have been physicians too much and teachers too little in relation to our students. We have let our curriculum simply grow up and have not guided it. There has been no scientific development of the curriculum as a matter of pedagogic practice. That is the thesis I wish to present.

THE USE OF THE DISPENSARY IN THE TEACHING OF CLINICAL MEDICINE*

By Louis Hamman, M.D.,
Johns Hopkins University,
Baltimore, Md.

Interest has stimulated me to hope that dispensary practice and teaching may some day be raised to the position of usefulness and dignity they deserve to occupy. It is unnecessary to say that medical work in the dispensary has not and does not now approach the standards demanded of private and hospital ward practice. The care of patients is for the greater part superficial and inadequate; students see and, therefore, are taught hurried and slovenly practice; the staff lacks enthusiasm and labors through an impossible burden of work without stimulus and without encouragement, driven on not by the reward of the work itself but by the hope of promotion that will put the drudgery behind. You may point to some clinics where these conditions do not exist, but for most dispensaries the statements are true. It is possible under proper conditions to give the highest type of medical service in the dispensary; to have an adequate and enthusiastic staff eager to profit by the opportunities presented; to teach many things better than they can be taught in the ward and some things that cannot be learned there at all; and to produce investigations and clinical observations as important as the best contributions that come from hospital ward and private practice.

The chief difficulty with our dispensaries is that up to a very recent time they have occupied a subordinate and insignificant position in the hospital organization. All thought and attention have been lavished upon the ward, and the dispensary has received scant consideration. It has been allotted inadequate quarters and equipment, and the staff has been forced to shoulder an amount of work it could not carry. In many instances it is frankly avowed that the chief function of the dis-

*Read in Conference on Medical Education, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

pensary is "to feed" interesting material to the ward. In planning the wards a specific number of beds are supplied and a staff is chosen large enough to care satisfactorily for this specific number of patients. If the beds are filled and more patients apply for admission they must be refused. Many worthy patients badly in need of medical care are turned away, but this is not thought heartless or indifferent; it is only the unfortunate necessity imposed by restricted accommodations. In planning the dispensary, available rooms are chosen often without regard to the use that will be made of them, and a staff is appointed to care for the patients. How many patients will come is unknown, but no matter how many come they must be seen in quarters large or cramped, by a staff adequate or inadequate. There is no fundamental difference between turning patients away from the dispensary because they cannot be properly cared for and turning patients away from the hospital because the beds are filled, yet the suggestion to run a dispensary on this plan has always met inflexible disapproval. It seems but common sense to urge that a dispensary be organized to do a specific amount of work. How can it be organized properly upon any other plan? Let it be decided upon the basis of available space, available money and available clientele, what number of patients can be cared for, and secure a staff large enough to give the best service to this number. If more than the maximum number apply they should be turned away and given preference upon the following day.

Another difficulty with our dispensaries is the lack of encouragement given the staff in facilities and in preferments. As a consequence, dispensary positions are held as stepping-stones to more desirable hospital connections and are gladly abandoned at the first opportunity. Apointments to ward service are eagerly sought; appointments to dispensary service are accepted as tentative and undesirable drudgery. Burdened with an impossible task, the dispensary physician hurries away patient after patient shamed by the consciousness of superficial attention. During the time that he might see three or four patients without unnecessary haste he has often to serve two and three times as many. Suitable clerical assistance is usually denied and in addition to rendering medical service he must act as his own clerk. No positions of dignity and prominence are open to reward his labors. Failing to secure a coveted ward service, he is happy if he can urge the demands of a growing practice as an excuse for resignation.

This attitude toward the dispensary is unwarranted and hampers its development. With good equipment, an adequate clerical force and a proper adjustment between the number of patients and the size of the staff, the work in the dispensary may be made as accurate, as interesting and as valuable as the work in the wards. Problems await solution in the dispensary that cannot be approached in the wards. With improvement in dispensary practice dispensary appointments will rise in dignity and importance. It will require but little change in organization to put dispensary service on a par with ward service and to make dispensary positions as desirable as ward appointments. The younger men working in a dispensary must see ahead of them promotion to reward faithful and efficient service. On the wards there are internes, a senior resident staff, a junior visiting staff and a senior visiting staff. Some similar progression must be established in the dispensary and each advance must bring with it lessened routine duties, but greater responsibility. Such positions would be worth working for and would be sufficient stimulus to command the best and undivided interest of the dispensary staff.

It is a matter of frequent comment how few clinical observations of importance have come from medical dispensaries, and how few men have risen to positions of prominence on the basis of dispensary achievement. Considering the volume of material handled in a dispensary, this is at first glance a serious criticism, but when one thinks of the inadequate facilities with which the work has been done and the pressure under which the staff has worked, it is in no way remarkable. Some important contributions have come from dispensaries and still more will come when

proper organization allows leisure and opportunity for careful observations. To the wards go mostly the acutely ill and patients in the stage of broken compensation from chronic disease. The early stage of these chronic diseases comes under observation in the dispensary, and here is one field which, properly cultivated, alone will yield a rich harvest of useful observation.

It may seem that I am hitting far from the mark to speak of dispensary organizations, when I have been asked to speak about the teaching of medicine in the dispensary, but the two are indissolubly bound together. The student learns more from the routine work that he observes than from the particular phases of the work that are culled out and held up for edification. The handling of the average patient impresses him more than learned discussion upon particular instances of disease. He must see in the dispensary as well as in the ward the kind of practice upon which he is to model his own practice in later years. I ask you teachers of medicine if you are willing to hold up the dispensary practice with which you are familiar as such a model? Until dispensary practice can be pointed to as model practice, all talk of adequate dispensary teaching is vain.

Up to the present time, teaching in the dispensary has followed chiefly two channels, the teaching of physical diagnosis and the teaching of medical diagnosis in clinics. The dispensary abounds with the most varied instances of particular lesions which the student must learn to recognize. He becomes acquainted with the instruments of his profession and learns to gather with their aid the invaluable data upon which diagnosis rests. This is the very foundation of practice. The most profound knowledge of the natural history of disease is of little use when skill in examining a patient is wanting. The teaching of physical diagnosis has usually been done in small groups in the dispensary and I believe has generally been well done.

In dispensary clinics students usually first approach the art of diagnosis. The history and physical findings are detailed and from the assembled data inferences are drawn. There is a charm about well conducted dispensary clinics that more elaborate presentations often miss. Their impromptu character calls for keen observation and brilliant inference. Can anyone fortunate enough to have attended the dispensary clinics of Osler ever forget the charm with which he invested them? In such off hand contact with patients his clinical skill rose to its highest level and his great teaching powers were most brilliantly displayed.

The criticism has been made that dispensary clinics give only a cross section of disease, a vivid picture of an illness at a given moment of time. The development of symptoms, the progress of the disease and the modification of the progress by treatment are missed. We should, of course, aim to give students a clear, consecutive picture of the natural history of disease. They should also be given the opportunity to test the accuracy of diagnostic predictions by the subsequent course of events. As dispensary organization improves and a closer watch is kept upon patients it will be simpler to follow them throughout their illness. In some clinics students follow the patients they present and keep the class informed as to subsequent developments.

The one phase of dispensary teaching that has not yet been developed is the diagnostic study of the routine patient. Students acquire a degree of practice in history taking and have their physical findings more or less carefully checked, but there is no opportunity to follow the study of the patient from beginning to end. Such a study comprises the history, the physical examination, the necessary laboratory investigations and detailed examinations in special departments. When all of these data are accumulated the final diagnosis is made and a plan of treatment suggested. This represents the

most difficult and finished type of dispensary teaching, the actual introduction to real practice. In order to carry it out successfully the dispensary must be organized on a higher level than most dispensaries at present are. Not only must the work of the medical department be carried on satisfactorily but the system of consultation with special departments must work expeditiously and efficiently.

To profit by such instruction the student must have finished his training in the fundamentals of clinical observation and laboratory technic. Most dispensary teaching is now done in the second and third years. Physical diagnosis and dispensary clinics belong properly to that period of study but it seems to me that before his fourth year the student is hardly ripe for the difficult and intricate problems that dispensary diagnosis presents. In the ward nearly all of the patients are acutely or seriously ill and present clear cut pictures of disease. In the dispensary the most varied material is encountered and it requires the highest skill successfully to analyze the situations presented. Here patients with serious complaints and minor ailments contrast with the patients who complain lightly and yet harbor mortal disease. Here are the wrecks of economic pressure, of social distress, of infection, of the wear and tear of life. The physician must carefully and systematically scrutinize all, assort and reassemble the material, and fit his treatment to the most exacting demands. The student sees therapeutics that is not treated of in pharmacology, that touches religion, sociology, hygiene and all the other varied activities of man.

In this medley of complaints and disorders full of clinical and human interest, the student finds a counterpart of what his own practice will later be. The dispensary cannot teach medicine as it should be taught until it shows the student a model of what this practice rightly attended to may become.

Discussion follows paper of Dr. Cohn, page 314.

THE USE OF THE DISPENSARY IN THE TEACHING OF CLINICAL SURGERY*†

By Isidore Cohn, M.D.,
Professor of Clinical Surgery, Tulane University,
New Orleans, La.

A dispensary represents a community service. It should be an institution of mutual service, equal to the lay community and to the medical profession. This ideal can only be realized when certain fallacies which exist in the minds of the profession have been corrected.

The chief among these which should occupy our attention are:

(1) A dispensary should not be regarded in the light of a feeder for an indoor service.

(2) It should not be considered a dressing station.

(3) The prevalent idea that the most inexperienced recent graduate should be allowed to have charge of a dispensary unsupervised is harmful to the patient and the physician.

When regarded as an admitting dispensary, perfunctory service is given to cases other than prospective operative cases; when utilized as a dressing station an orderly may well substitute the attending surgeon; and when left to the most inexperienced members of the staff, the patient fails to receive the highest type of service and the attendant may develop habits which will not bring out the best which he is capable of producing.

In the recent great war the fallacy of having the most inexperienced at or near the front was soon realized and operating teams having the best men soon replaced them.

If teaching is to be done in the dispensary, I hold that we must have some of the most capable men attached to the staff to do this teaching. Let me state at the outset that I hold that the dispensary is one of the most valuable assets of our

*From Surgical Division, Touro Infirmary.

†Read in the Conference on Medical Education, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

curriculum when the teaching is done with a view of rendering service.

Clinical surgery as taught in an ideal clinic is as valuable as bedside instruction on the medical service.

At Tulane one of the most valuable teaching clinics has been the so-called "Dry Clinic" of Professor Matas on Thursdays. Cases are presented to the classes and differential diagnosis and treatment are discussed. It is not such a thing as can be prepared by the lecturer, nor have we typical text book pictures to present.

In a modest way others may organize a dispensary for teaching clinical surgery. When teaching is to be done it is essential that the instruction of students will not interfere with the service to be rendered the patient. In order to accomplish this one must have qualified assistants who will "carry on" during the hour of class work.

It has been our policy to give instruction in a room apart from where the ordinary dressings are done.

Some may ask what are some of the advantages of teaching clinical surgery in a dispensary?

As a teaching institution from the surgical point of view the dispensary offers opportunities for a review of anatomy and the application of your knowledge of the subject for the benefit of the patient. This may well be illustrated in the teaching of fractures. The proper knowledge of muscle origin insertion and action can be taught. When this is understood the student can follow logically the application of methods of reduction which attempt to bring about an equilibrium of forces. Without such a knowledge of anatomy the student must memorize the particular methods taught. I hold that the ideal method of teaching any subject should be analytical and synthetic and not a memory test. Teachers in dispensaries must of necessity be students of experience and not recent graduates.

Every effort should be made to combat as far as possible memory work and substitute for it methods of logical deduction.

Teaching clinical surgery in dispensaries develops the powers of observation. It should be made clear that I am not advocating individual case work but rather demonstration of individual cases to small groups of students. It is not our policy or belief that dispensaries can be utilized for teaching clinical surgery if one teacher in a limited period "farms out" a case to each of ten students and then spends a few minutes with each student on his case.

In a dispensary one can demonstrate the principles of surgery which the student has been taught in the didactic courses.

This presupposes that teaching is being done in well organized dispensaries where the principles of asepsis are considered as sacred as they are in the main operating rooms of the institution. There is no better place for teaching traumatic surgery of the ambulant type.

Differential diagnosis can be taught particularly well in a dispensary if the surgeon has vision. Since one cannot always have on hand for purposes of differentiation the various conditions with which the case in point may be mistaken, he can at least have a fairly adequate substitute by collecting photographs of type cases which come under his observation. For example, a patient presents a cervical mass. If one has collected a series of photographs of the many conditions, benign or malignant, acquired or congenital, acute and chronic infections, blood dyscrasias and the like, the student can be and is interested by such discussion.

Without such a presentation the student may be prone to make a diagnosis which will be proven wrong by one who has been taught by more careful and painstaking methods.

The student in after life reflects the character of his teachers to some extent. It adds to the glory of the institution and to the satisfaction of the teacher if he has served as a stimulus for others. The dispensary offers such an opportunity in the teaching of clinical surgery.

METHODS

It has been suggested that the methods adopted in our dispensary might prove of interest.

A case is presented to the class. If it is an injury the history is obtained. An attempt is made to have the student real-

ize that loss of function is the result of a loss of equilibrium of forces and that in order to interpret this disability properly he must know the groups of muscles which have been rendered inactive by the accident. Students are taught to make their examination in a systematic manner by inspection, palpation, mensuration, the roentgenogram, and manipulation.

Great stress is laid on the value of inspection. The attitude of the patient, change in the axis of the limb and other evident deformities must be noted by the student.

We are all too familiar with the tendency to lay hands on the patient to determine the points of abnormal mobility and crepitus. Our students are impressed with the idea that by a properly taken history, inspection and gentle palpation one can often arrive at the diagnosis, provided he interprets what he sees in the light of his anatomy.

In the course of the examination of an injury about a joint, all of the possible conditions are discussed and eliminated so far as possible.

The proper interpretation of the x-ray plate is freely discussed, particularly if the patient happens to be a child. The normal epiphyses are so often misinterpreted as fractures and epiphyseal separations that we illustrate each joint at all ages by lantern slides. In this way the student becomes familiar with a subject about which there is a rather general misunderstanding.

The class witnesses the reduction of the deformity and the application of the proper splints. All of the dangers incident to improper splintage and bandaging are discussed, when possible cases of Volkmann's ischemia are presented, to illustrate one of the complications which should make them, as conscientious men, consider the subject of their work seriously.

A case is then followed during its aftercare. In our dispensary, wound treatment is discussed and illustrated. The students have the opportunity to see the value of debridement and the various antiseptics.

Infection of the hand and finger felons, tendon sheath infections and the like are discussed after the plan of Kanaval and the principles of treatment applied in the presence of the students. Differential diagnosis of any surgical condition can be taught in the dispensary in as satisfactory a manner as anywhere else.

The lantern slide, photographs, specimens and x-ray pictures are valuable aids in teaching.

One thing is necessary beside material with which to teach, that is, enthusiasm on the part of the teacher.

DISCUSSION

Papers of Dr. Hamman and Dr. Cohn.

Dr. Randolph Lyons, New Orleans, La.—It seems to me that the present status of the clinic makes teaching difficult. In other words, until medical men themselves, and lay people, appreciate the value of much better clinics and what they can do for humanity, teaching will be difficult in clinics. One of the reasons for this Dr. Hamman mentioned—insufficient help. The majority of clinics are overcrowded. They do not limit the number of patients, so that when it comes to teaching medicine in the out-patient department it is a difficult problem. In the wards in New Orleans we are very fortunate in having a great deal of material, and we are able to use for teaching purposes in many instances patients who are able to sit up, although I must say that I do not think the examination of patients in the reclining position is good experience, not only for the student but the physician, because we all have to examine many of our patients in bed and it certainly does make the physical signs more difficult to interpret. For instance, the respiratory sounds over a lung that is compressed by the patient's lying on the side are certainly different from those in the lung which is not compressed.

These points, while small, are important, and I try to bring them out to my students, that we ought to expect different signs in a patient lying down from one sitting up.

I appreciate Dr. Hamman's paper very much because he has pointed out the evils that most of our clinics have to contend with. If we could have clinics such as he describes, with the proper amount of clerical help, the proper amount of space, and limited number of patients, it would be an ideal place to treat patients and teach medicine.

Dr. Douglas VanderHoof, Richmond, Va.—I would like to think that these two papers could be given wide circulation. We realize that it is in the dispensary that the student gets his first introduction to clinical medicine, and the responsibility for teaching there is great. Yet, as Dr. Hamman has brought out so clearly in his paper, the dispensary teaching leaves very much to be desired. Of course it is true that we have good, bad and indifferent dispensaries; but I would like to see, from the standpoint of our effectiveness as teachers, a survey made of the teaching dis-

pensaries throughout the Country. I remember so well in my student days the contrast between the work in the dispensary and in the wards. It is not so many years ago that in the dispensaries in this section of the Country practically no laboratory work was done on the patients. We had one microscope that stood on a window sill, and once in a while a little fresh blood was examined under it. Urine examinations were not made. Then by contrast in the wards we found the patients well studied. In some respects it would be better if the dispensary could be eliminated and if the student got his first introduction to clinical medicine in the hospital ward where he could see the patient properly studied.

I have done a good deal of teaching in the dispensary, and have always dreaded it, for the reason that while in the course of private work one may see four or five patients a day that can be adequately studied, in the dispensary one may see in two hours ten or fifteen patients, who as a rule are not intelligent enough to give any assistance in taking the history or when it comes to discussing treatment. How much more difficult it is to try to treat a stupid individual than one who is intelligent! I have often said that the best patients I have are lawyers. I would rather treat them than any other class of individuals, because they are trained to accept facts and analyze them.

Then again, the personnel of the teachers has been rather indifferent. As Dr. Hamman said, teaching in dispensaries has been relegated to men who have not had experience in teaching in the wards. Recently in the Medical College of Virginia we have put into effect a little scheme that I think will prove helpful. We have what we think is a very good dispensary. All patients have routine blood and urine examinations made, including the Wassermann test. In this respect the dispensary is good, but we have always had difficulty in manning the medical department in the dispensary. Now we are putting into effect this scheme: each chief of clinic is asked to choose his own assistants. Each chief serves six months, coming to the dispensary two days a week. We encourage the chief to select his own assistants, men who are friends of his and will be loyal to him and work with him harmoniously and try to establish an excellent clinic; men who will be faithful in their attendance. Then we encourage the chief, if he is especially interested in one phase of medicine, to emphasize this, so that gradually we hope on Mondays and Thursdays, for instance, to have those patients that are suffering with gastroenterological troubles; on Tuesdays and Fridays, heart cases; and on Wednesdays and Saturdays, another group of cases, etc., having the men who are interested in certain phases of internal medicine take care of a certain class of cases. Of course they all have to take care of any patient who first applies on that day. We are not trying to specialize within the department of medicine, but we are trying to arrange certain clinics on certain days.

I think Dr. Hamman's paper was unusually clear, and I think the most important point he brought out was the fact that if we could limit the attendance of patients at the dispensary each day we certainly could do much better work.

Dr. M. L. Graves, Galveston, Tex.—I think we are indebted to Dr. Hamman and Dr. Cohn for their effort to dignify the dispensary service. Until that is done we shall find that it will continue in its more or less dull and deadly routine. Yet all have their individual problems. When we visit the larger clinics of the Country, such hospitals as the Barnes Hospital, in St. Louis, and see their elaborate out-patient departments, their staffs and their fine organizations, it is sometimes discouraging to men from a smaller institution where they have smaller quarters and a smaller clinic to handle the patients.

At Galveston for a number of years we had great difficulty with the out-patient service in the dispensary. Then we reorganized, and it has been working much more satisfactorily. That clinic is now in charge of one of the associate professors of the institution, who acts as general superintendent of the service and as executive officer directs its functions. The medical clinic in my own department is in charge of the associate professor of medicine, who has had years of experience as a teacher of laboratory methods, and also as a teacher of clinical medicine. We do put new members on the staff of the dispensary, but associated with the experienced. All the members on the medical staff successively serve in the out-patient department, and they are under the supervision in my department of this associate professor of medicine who has had experience. There is an effort to make the teaching service not merely second in importance to the treating service, but a very important and coordinate branch of the service. We send our men into the clinic for two-hour periods three times a week, because we feel that if the men go only twice a week or less they will not be able to keep track of their cases sufficiently well to utilize the highest clinical values.

Then, too, there are problems that confront some of us in the South that do not confront those in the East, where you have no color line. Where we have a large negro and Mexican population and they have to come to the same clinic, unless we have a large amount of room and a well organized staff, there is a tendency on the part of the negro class to limit the teaching value of the white cases. I feel if these clinics could be organized as we are going to do, with separate departments, particularly in separate buildings, with the staff well organized, we would have not only the highest teaching value for the students, but the best service to the patients.

Dr. Charles L. Minor, Asheville, N. C.—I cannot agree with Dr. VanderHoof. He does not think that the student should go first to the dispensary. Dr. Hamman, on the contrary, thinks the dispensary represents the patients the student will have when he gets into practice; and I think Dr. Hamman is right. The difficulties are great, but, after all, in the dispensary, if it is run properly, you get exactly the conditions that the young man will get in his office: the sizing up of the case quickly, the proper taking of history,

i. e., meeting the thing without all the assistance he has in the wards. He cannot have all these things in his office. Do you not remember when you first came out of the hospital how you missed the nurses' help when you had to do it "on your own?"

Dr. Hamman has put his finger upon the fundamental point, that dispensary positions are a temporary stop-gap which men do not regard seriously. If there is some way worked out by which dispensary positions can be made desirable, so that an active physician can still enjoy his association with the dispensary, then dispensary practice can be shown to the students in the right way. The student will not have all the assistance he has in the ward, but when a patient walks into the office and sits down you are confronted with the same thing as in the dispensary. I think the dispensary is the ideal place to introduce men to the practice of medicine.

Dr. Robert Wilson, Jr., Charleston, S. C.—These papers are of great importance, indicating one of the weak points in clinical teaching, and at the same time emphasizing the immense value which dispensary instruction has in the teaching of medicine.

It is almost the universal custom for the student to receive his first introduction to medicine in the dispensary, but I question if it is wise to do so. I am inclined to believe that senior students would get a great deal more out of the dispensary if they had been prepared by work in the wards. Patients also would receive better service. In the dispensary we see ambulant patients whose symptoms are often rather vague, and more experience is required to handle such cases than is possessed by junior students. If the student had his first contact with medicine in the wards, where he meets well developed cases and where he has the opportunity for much more careful study, he would be in a better position to analyze the early cases which he meets in the dispensary.

In our school both junior and senior students serve in the dispensary, the juniors acting as assistants to the seniors. I am not sure that we have worked out an entirely satisfactory system, but I believe that both students and patients receive more benefit than if juniors alone were assigned to the dispensary.

Another weak point in the dispensary is the lack of social service. Even in small schools I think that we could develop a better social service, and I am sure that it would be of immense value in dispensary teaching.

Dr. Tom A. Williams, Washington, D. C.—In the first place, dispensary patients are of two kinds: there is the patient who upon diagnosis is admitted to the hospital and becomes a hospital patient; and there is the patient who is treated as the ambulant patient. It is with the latter that we deal, in reality. The ambulant patient is in need of treatment and care which extends far beyond what can be done by giving a prescription or by minor surgical treatment in the dispensary. It extends into his care at home, to the recognition of conditions that made him sick. In order that this may be done it is necessary that home conditions be diagnosed and dealt with. There must, therefore, be either a thoroughly organized social service department to do that, or the kind of plan which was in force when I studied medicine in Edinburgh. That consisted of a certain number of students—those studying under a certain physician who was in charge of a certain dispensary affiliated with the medical school—being expected to take charge of the patients who came to the dispensary, or who were sent there for medical aid, go to their homes and behave toward them exactly as a physician would behave toward patients who are paupers and not able to pay. I gained my most valuable experience in adaptation of clinical methods to the conditions we find in poor homes in that way, because my own physician, who was supposed to consult with us in our difficult cases, never once came to see a patient with us. That threw me on my own resources, and I really learned more than if he had told me what to do.

It does not seem to me beyond the point of practical organization to arrange so that students can visit patients in their homes—students who are properly accredited in the dispensary service. Surely the junior student is better than a social worker. He knows more; he has a better education, and is more interested in the particular problem as a medical one.

As to junior and senior students, I think, as Dr. Wilson says, that the work of the dispensary would be better accomplished by senior students. The weakness is that the student has become set in his mind both in the treatment patients receive in hospitals and the assistance he receives there, which takes a great deal of responsibility from his shoulders, whereas in private practice he has to assume all the responsibility. Therefore, it seems to me it is better to have the junior student go into the dispensary and observe problems which he cannot solve because he has no knowledge of them, but which he can keep in mind in his future study of clinical medicine and find the solution to some of these problems in the hospital. Then in the senior year let him be given an assignment for three months to follow up patients: follow individual patients from the dispensary to their home; be responsible for these patients to the dispensary; and visit them as often as he wishes. He is as well equipped as we can make him to deal with these problems, and he will gain immensely in ability to deal with the problems he has to face when he goes into practice and which he does not face at present. It does not seem to me it will mean an undue consumption of time in proportion to the great benefit that will be gained. Furthermore, it would greatly increase the efficiency of the hospital for medical relief, because it is impossible at present to carry out in the hospital the things that should be carried out. Even the Massachusetts General Hospital feels it quite fails in that regard were it not for its social service group. It seems to me the assistance of medical students in small places, especially in the South, would be of great benefit to the hospital, to the medical school, and to the city in which it is situated.

Dr. Lewis J. Moorman, Oklahoma City, Okla.—I was much interested in what Dr. Hamman said about the limitation of the number of patients in keeping with the capacity of the dispensary, and also with reference to the practice of placing the younger, inexperienced men in dispensary practice with the understanding that the older men of ability are to be left in connection with hospital and ward practice. I have often thought, from my own experience and from observation, that the greatest handicap to successful dispensary work is the fact that we have more patients, as a rule, than can be properly handled.

Since we are more apt in dispensary work to get diseases in their early stages, I should like to emphasize further the importance of careful history taking, especially since the earliest manifestations of disease are usually through symptoms, and symptoms are to be carefully and properly correlated through careful history taking. I think this is very important. I believe it was McKenzie who, in commenting upon the question of the younger, inexperienced men being placed in dispensary work, said that often cases are kept under observation for a time, their symptoms being studied, and by and by when gross anatomical changes are demonstrable, it is thought advisable to refer patients to some more experienced staff member, when it is often too late to get the best therapeutic results.

Dr. I. I. Lemann, New Orleans, La.—At Tulane we have had some variations of the method suggested by Dr. Hamman. We have third-year students in the wards and fourth-year students both in the wards and in out-patient clinics.

Dr. Hamman (closing.)—I feel that the discussion has missed the one important point I wish to make. Perhaps it has been passed over because it is perfectly obvious. It seems to me it is of relatively little importance whether third-year students or fourth-year students work in the dispensary. The one important matter is that the dispensary be organized to do its work in an efficient way. When new hospitals are erected the organization of the dispensary should be an important part of the plan. As I have said, it should be planned to meet a specific and definite demand. The space and the number of physicians working in the dispensary should be accurately proportioned to the number of patients admitted. Without such planning no dispensary will work efficiently.

Dr. Cohn (closing).—In regard to the fundamental problem which Dr. Hamman mentioned—planning the hospital for beds without regard to the out-patient department—the way we got at that in planning the new addition to Touro Infirmary was this: we have planned a five-story building, the ground floor to be devoted to the dispensary. Each man in charge of the dispensary has been approached both by the architect and the superintendent to find what his needs are. When the architect (who is a hospital expert) was down there he asked, "What do you need so much room for?" We need it to handle the patients properly: for treatment rooms, for operating facilities.

If you want men to do their work well I believe you must do what someone inferred could not be done in a dispensary, that is, get proper cooperation of your various staffs for consultation. It can be done and done more readily in the dispensary than in the hospital. One morning we can take a patient with a vague pain in the shoulder and refer him to the laboratory for a Wassermann, to the x-ray department, to the orthopedic man, and have him ready for the class at the next meeting. It is necessary to have an organization, it is necessary to do the thing which the Doctor says has not been done, namely, stimulate your associates so that a position in a dispensary will be honorable. We are trying to do that as far as possible in our work at Tulane. I do not, however, agree with Dr. Williams that social work is better done by the junior and senior students. I think most of us do not understand what a good social worker can do for us.

THE TEACHING OF A SURGICAL SPECIALTY*

By M. F. Arbuckle, M.D., F.A.C.S.,
St. Louis, Mo.

During the past decade, but especially since the war, much thought and effort have been expended upon the problem of improving the methods of training students in oto-laryngology. From the results of this work, and from several years of practical experience in undergraduate and graduate teaching in the Washington University School of Medicine, we feel that the ideal arrangement is a properly equipped out-patient department of a medical school with hospital accommodations. Under this arrangement it is, of course, necessary to instruct undergraduate as well as graduate students. It is better to keep the undergraduate and the graduate students separate.

The undergraduate should first of all be reviewed in anatomy. He should then be taught the names and method of using the various instruments required in examining patients. Operative work of any kind is, of course, out of the question for the undergraduate, for no man should be taught operative technic until he has learned to recognize the indications for surgical treatment.[1] Didactic lectures

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*Read in Conference on Medical Education, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

are necessary and important for the undergraduate, but he must also have actual clinical experience. If he becomes sufficiently deft to see the various parts and recognize the landmarks and their appearance in the normal, and if he gets a good idea of the very important relationship of disease in this region, in many instances, to other bodily ailments, then we shall have done our duty by him and it is all one can hope to accomplish in the short time available in the present curriculum.

The teaching of graduate students is a very different matter. Applicants for this kind of instruction come from many and widely varying situations. They may be men who have only just completed their interneship in a general hospital or they may have been in practice for a number of years, frequently having done special as well as general work. A year's interneship in a general hospital should be the minimum preliminary training accepted for matriculation in the post-graduate department. Men who have had a few years in general practice do better as graduate students.

Some of these men wish to learn only enough of diagnosis and local treatment to enable them to recognize the normal and thus better to carry on with a general practice, without pretending to do surgery as specialists. Others wish to become well qualified, competent specialists. Still others wish to obtain further training in some sub-department of the specialty. The interne in general hospitals frequently wishes to learn the technic of tonsillectomy or submucous resection, etc.

For the men who wish, as general practitioners, merely to be able to recognize the normal, a short review of the anatomy and pathology, with a few weeks of daily clinical work, should suffice, and this is a service which our medical schools should render.

For the man who wishes to become a specialist, a very thorough course in anatomy, gross and minute, and in pathology, gross and minute, should be given. Much of this work must be done alone, but according to a definite outline. He should be familiar with the physiology of the special senses and, of course, with roentgenology, bacteriology and serology. The physics of sound is important. In the latter half of the course, surgical technic on the cadaver should be taught.

The minimum time for such a course should cover a period of twelve months and new students should be accepted at stated times at least twice a year. One-half of the day for the entire year should be devoted to clinical work and the remaining

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8 a. m. to 10 a. m.	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds	Cadaver Operative Work Ear, Nose and Throat	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds
10 a. m. to 12 Noon	Library	Library	Library	Library	Library	Library
2 p. m. to 4 p. m.	Clinical Diagnosis and Treatment of the Ear, Nose and Throat	Section "a" Clinical Diagnosis and Treatment of the Ear, Nose and Throat Section "b" Nasal Operations	Clinical Diagnosis and Treatment of Ear, Nose and Throat	Section "a" Clinical Diagnosis and Treatment of Ear, Nose and Throat Section "b" Nasal Operations	Section "a" Clinical Diagnosis and Treatment of Ear, Nose and Throat Section "b" Nasal Operations	Clinical Diagnosis and Treatment of Ear, Nose and Throat
4 p. m. to 5 p. m.	Didactic Lectures Diseases of the Ear, Nose and Throat	Lecture on Clinical Rhinology by Dr. Sluder	Anatomy Ear, Nose and Throat July 1 to Jan. 1 Pathology Ear, Nose and Throat to July 1	Clinical Pathological Conference Department of Pathology	Didactic Lecture Ear, Nose and Throat	

part to laboratory work and reading. About 75 per cent of the time allotted to clinical work should be spent in the much more important and difficult problem of learning to examine patients and make proper diagnoses and in becoming familiar with the indications for surgical treatment. During the latter part of this time the student should assist at operations.

The remaining 25 per cent of the time allotted to clinical work should be utilized for the teaching of operative technic and post-operative treatment. The student, in order to learn to operate, must actually do the work himself, of course under supervision.

Much valuable work is to be had by the resident on the special services in a general hospital. Up to the present we have not had a resident on our service in the Barnes and Children's Hospitals, but the position of externe has been created. This is filled by men selected from our class of graduate students. It is considered very much worth while by the men who have held it, since they have access to all the house consultations and special cases as well as the operative work of which they actually do a very considerable portion.

In learning to examine patients and make proper diagnoses, a definite outline of procedure should be followed, a typewritten copy of which should be supplied to each student. With this outline to follow, especially at first, students can more readily be led to proceed independently, thus learning self-reliance in coping with any problem presented. After the student has examined a case and written down his impressions, his work should be gone over by an instructor. This will provide an opportunity for discussion of difficult cases and correction of possible errors.

While looking over the work of the student, it is essential constantly to remind him of the great importance of cooperating with men in other fields. For example, cases in which extreme headache, choked discs, dizziness, vomiting, etc., exist should, by all means, be carefully gone over by the neurologist and the oculist. Cases in which there is paralysis of one or both vocal cords should have a careful general and neurological examination. Frequently the only visible clinical evidence of syphilis, either recent or of long standing, is to be found by the oto-laryngologist. He must ever keep in mind that many constitutional diseases, both in children and in adults, frequently have their beginning in some focus to be found in his field. If students who are being trained in this or any other surgical specialty be thoroughly impressed with the importance of learning to recognize the indications for surgical interference before troubling themselves to learn the operative technic, there would be fewer unnecessary operations. If many so-called specialists had a proper conception of the anatomy and pathology, there would be fewer ill-advised and useless operations upon the nose and throat.[2]

Specialists, already recognized as such, occasionally desire further training in some subject. Many of these men are well grounded in the fundamentals and they can, in a much shorter time, secure additional training which will be of the greatest help and benefit to them and to their patients. Such courses can best be provided by special arrangement.

After a graduate student has had a year's work as above outlined, he will profit greatly if he take at least six months' further training in clinical work.[3] The ideal method of doing this is by interneship in a special hospital which has a well equipped out-patient department, or as resident on the special service of a general hospital. His time should be equally divided between the study of cases from a diagnostic viewpoint in the out-patient department and hospital work, of which a great portion will be operative. In this way the surgical work does not overbalance and tend to make the student forget the importance of painstaking examination necessary for establishing proper diagnosis.

The hospital interne on general service who wishes to learn operative technic in nose and throat should be made to understand, both for his own good and for that of his future patients, the necessity for his being able to recognize the indications for surgical interference before learning to operate.

It has been recommended by the Committee on Graduate Teaching of the Section on Oto-Laryngology of the American

Medical Association that men who propose to set themselves up as specialists should be required to present a certificate of proper training from an institution which, in turn, is known to be adequately equipped for such training.[4] To this recommendation we do most heartily subscribe. The writer was astonished recently by the information that an order had been issued from headquarters in Washington that trainees in the Veterans' Bureau who wish to become eye, ear, nose and throat specialists may have only nine months' training, a period manifestly insufficient in which to learn any one of the specialties.

If, regardless of the extended efforts on the part of men who stand very high and who have been delegated by the profession to devise methods for improving the quality of the training offered to the younger men who are coming into the specialty, such an order as this is allowed to continue in force, it will be a long step in the wrong direction. It indicates that there has been a failure to perceive the incompatibility of short terms and adequate training.

REFERENCES

1. Journal A. M. A., Vol. 79:365, July 29, 1922.
2. Minnesota Med., Vol. 4:419, July, 1921.
3. Bulletin A. M. A., Vol. 15:40, January 15, 1921.
4. Bulletin A. M. A., Vol. 15:40, January 15, 1921.

DISCUSSION

Dr. H. W. E. Walther, New Orleans, La.—I feel that the teaching of the specialties is the biggest storm center in medical teaching. I can recall very well my mental state in relation to the specialties just after I graduated, and what I was supposed to have learned in the undergraduate school about the specialties. It certainly was very vague and I was tempted to admit that I knew nothing about them. I think that holds equally well for the graduate of the medical school today. The undergraduate school, however, is in a very peculiar position. It must give some instruction in the specialties, for it has the responsibility of training not only the man who is going to practice in a medical center, but the man who goes to the small town and who will not have at his command his confreres in specialty work who can help him out of a tight place. He must do a great deal of semi-specialist work himself as cases present themselves, and for that reason the undergraduate medical school must do something toward making the medical student acquainted with the specialty side of medicine, and this is undoubtedly a hard thing to do.

Certainly the teaching of the specialties resolves itself more into post-graduate work. I am glad that Dr. Arbuckle brought out the point about the time of teaching the specialties. Certainly the ideal time is from one to two years, and I believe we are all in our post-graduate schools coming to feel that way, and almost to demand that the six weeks' post-graduate work be a thing of the past. In this instance we cannot bow to the demand to have such a course. Either in eye, ear, nose and throat, dermatology, urology, or what not—we cannot give these short courses and stand behind them. The man who is preparing for special work in medicine must devote at least one or two years to it to be in any way competent and to deserve the cognomen of specialist in medicine in that particular line.

This is a very important subject and it is one upon which the profession will have to work in the future. The status of the specialty branches in the under-graduate school is certainly one that will have to be revised a good deal in order to decide just exactly how much to give a man.

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C. P. LORANZ, Secretary-Manager

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
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FATALITIES FOLLOWING MINOR OPERATIONS UPON THE NOSE AND THROAT

In view of the comparative paucity of reports of fatalities following nose and throat operations and the tremendous operative activity of oto-laryngology, it is of interest to note a compilation of fatality reports which occurred in different parts of the Country. Dr. H. W. Loeb* sent out letters of inquiry to 5000 practitioners, and from approximately 700 replies obtained reports of 332 fatalities, which followed operations not generally considered serious.

Meningitis was the cause of death after 120 nasal operations, and hemorrhage in 55 of the other cases. Death followed tonsillectomy in 126 cases.

The causes of death are thoroughly analyzed by Dr. Loeb. Meningitis occurred most frequently after those operations which came into relation with the lamina cribrosa. It came on as a rule within twenty-four hours after the operation, and was usually best explained as due to a fracture into the cranial cavity.

The main causes of death after tonsillectomy were hemorrhage, respiratory complications, and general sepsis.

This is a rather startling report. Whether these fatalities could have been prevented, and how to reduce to a minimum the future mortality from the operations usually known as minor, is the problem of the specialists in this line.

Some suggestions of Dr. Loeb may be mentioned. The operator should have a thorough knowledge of the anatomy of the nose and throat, which can be gained only by arduous study in the dissecting room. In other words, there should be a high standard of qualification for specialization in this line as in all others. There should be careful pre-operative study of the patient and if possible hospitalization. The attention to asepsis should be, as far as possible, the same as for a major operation.

*Loeb, H. W.: Annals of Otology, Rhinology and Laryngology, XXXI, 2, 273.

ANAPHYLAXIS IN EVERY DAY PRACTICE

Anaphylaxis in the ordinary medical use of the term occurs when certain troublesome symptoms follow the ingestion of certain foods, such, for instance, as strawberries, egg albumin, and shell fish. The reactions are probably due to protein sensitization which in a majority of instances could be demonstrated by proper methods of diagnosis.

Drug idiosyncrasy as seen with iodids, bromids, iodoform and various alkaloids is looked upon by many as being an anaphylactic phenomenon even though no previous sensitization has taken place. Some consider the nitroid crisis observed following the administration of arsphenamin as anaphylactic, because of its resemblance to anaphylactic shock.

Diagnostic tests are frequently used which depend upon the patient's being sensitive to a particular protein. The skin reaction in tuberculosis, or the von Pirquet reaction, is an example of this kind, as is also the luetin reaction in syphilis. There has been introduced a series of tests covering what may be called the protein index, to detect susceptibility to all common proteins.

The most prominent of the diseases due to anaphylaxis are asthma, hay fever, and some lesions of the skin such as urticaria. Brilliant results are often obtained by detecting the particular protein causing the trouble and desensitizing the patient, or removing the cause by a change of food or climate.

A practical and common application of our knowledge of anaphylaxis is the custom of injecting one or two cubic centimeters of plain horse serum, anti-tetanic serum, diphtheria antitoxin, etc., as the case may be, and then waiting for three to five minutes before administering the full dose. Many a fatality has been averted by this conservative means of testing the individual's sensitization to the protein before giving the therapeutic amount.

Anaphylactic phenomena, then, are taking place daily in the work of the practicing physician. Close observation and recognition of them will assist in diagnosis and treatment, and greatly benefit both doctor and patient.

CANCER PREVENTION

The American Society for the Control of Cancer is one of the public health movements which found its inception within the ranks of the organized medical profession, and which has been, ever since it was organized in 1913, controlled by physicians.

Its object is to inform the laity that "Cancer is curable if one will but seek the advice of the family physician in time" and to give to the public the symptoms and signs of early cancer, in order that every individual may recognize a condition which may become cancer, and apply promptly for treatment.

As the American Society for the Control of Cancer is an institution working hand in hand with the medical profession, every physician should give the movement his hearty support. The problem of educating the laity properly with regard to any public health problem, which requires almost individual instruction, is apparent. The enormity of the task is realized only when one recalls that in America there are 110,000,000 laymen dependent upon the instruction of 146,000 physicians, which means that every physician will have approximately 800 "pupils" to instruct.

Great publicity must be given to the facts that cancer is not contagious; that it is not hereditary (in the lay sense of the term); that nearly 100,000 people are needlessly sacrificed yearly in the United States because they do not recognize the symptoms of cancer early and come in time for treatment; that beginning cancer is localized and in this condition curable; but that in time (and no one can predict just when) it metastasizes and is then hopeless.

The public must be made to realize that cancer takes its greatest toll from persons in middle life and hence is of the greatest economic importance.

The public is ignorant of medical matters and must be taught that advertisements (as well as patent medicines of all sorts) claiming to cure cancer are frauds and that the public salvation in this, as in all other medical problems, must depend upon the medical practitioner. Few indi-

viduals would take their automobiles to a plumber, but some of them take that much more complicated machine, the human body, to less competent persons for treatment. The public must be advised of the dangers of quacks and the various cults which ape the medical profession.

Laymen must be taught that any persistent irritation or sore, that any lump in the female breast, that any abnormal discharge from any of the orifices of the body, and that even persistent indigestion may mean cancer and can only be excluded by a thorough physical examination by a competent physician.

Correspondence

SYMPTOMATOLOGY, PATHOLOGY AND RATIONAL TREATMENT OF BOTULISM

Editor, SOUTHERN MEDICAL JOURNAL:

In the February number of the SOUTHERN MEDICAL JOURNAL there appeared an article entitled "Symptomatology, Pathology and Rational Treatment of Botulism." I wish to make this correction: that the majority of this article was taken from Public Health Bulletin 127, J. C. Geiger, E. C. Dickson, and K. F. Meyer, and of which part E. C. Dickson was mainly responsible.

Yours very truly,
J. C. GEIGER, *Epidemiologist*,
U. S. Public Health Service, and
Associate Professor of Epidemiology.
University of Chicago,
March 12, 1923.

NATIONAL BOARD OF MEDICAL EXAMINERS

Editor, SOUTHERN MEDICAL JOURNAL:

The following information concerning examinations by the National Board of Medical Examiners is announced:

Part I, June 25, 26, 27, 1923; and
Part II, June 28, 29, 1923.
Part I, Sept. 24, 25, 26, 1923; and
Part II, Sept. 27, 28, 1923.

All applications for these examinations must be made on or before May 15, 1923.

Further information may be obtained from the Secretary.

Very truly yours,
J. S. RODMAN, M.D., *Secretary*.
1310 Medical Arts Bldg.,
Philadelphia, Pa.,
March 19, 1923.

Book Reviews

Hygiene and Health. By Dr. Charles P. Emerson and George H. Betts, Ph.D. Book One, 209 pages; Book Two, 355 pages. Indianapolis: Dobbs-Merrill, 1923.

Dr. Charles P. Emerson, Dean and Professor of Medicine in the University of Indiana, and who is remembered by Southern physicians as Resident Physician of Johns Hopkins University for many years, has met the need for an authoritative text book on hygiene for use in our schools by preparing "Hygiene and Health." This two-book series for use in the middle and upper grammar school grades presents the important facts regarding personal and community hygiene in a manner that can be understood by very young children, and without the pseudo-scientific misinformation that has been found in similar text books that have been written largely by laymen.

The elementary book discusses health habits, food, air, and the care of the teeth, skin, hair, etc., in a way that is easily understood by children in the lower grades. The advanced, "Physiology and Hygiene," is the best simple physiology that the writer has reviewed. The study of this book will give to older children not only a working knowledge of applied physiology, but the important, usable facts regarding communicable diseases.

The use of such books in teaching children how to live hygienic and efficient lives means that the men and women of the next generation will be healthier, happier and longer lived than their fathers and mothers.

Orthopedic Surgery. By Sir Robert Jones, K.B.E., C.B., Ch.M. (Liverpool), F.R.C.S. (England, Ireland and Edinburgh), F.A.C.S. (U. S. A.); Director of Orthopedic Surgery, St. Thomas' Hospital; Lecturer on Orthopedic Surgery, Liverpool University, etc. And Robert W. Lovett, M.D., F.A.C.S., John B. and Buckminster Brown Professor of Orthopedic Surgery, Harvard University, etc. 697 pages and 712 engravings. New York: William Wood & Co., 1923. Cloth, $9.00.

In this, the first edition, the authors have combined the best in orthopedic surgery of two continents. The method of approach to the various subjects is somewhat new, but it is reasonable, and probably desirable, in that it stimulates thinking rather than remembering.

The discussion of the anatomy and physiology of the various joints, before taking up their pathological conditions, is of much value. The intention of the authors is carried out, in that they do not go into minute details for conditions generally well understood and for which there are already proven methods of treatment.

Conditions which have been more or less baffling heretofore, without definitely proven procedure for their treatment, are considered at length in the light of more recent knowledge. Emphasis is justly placed upon diagnosis and differential diagnosis.

There is good, useful information in all the chapters about joint pathology, but the following stand out as being especially good: Disability of the knee joint, the several chapters on tuberculosis of the various joints, arthritis deformans, spastic paralysis, poliomyelitis, muscle training and congenital dislocation of hip joint.

The diagrams, illustrations, photographs and x-rays are unusually clear and well illustrate the conditions described.

Taken as a whole, it is the best work on the subject that has yet appeared.

Montaigne and Medicine. Being the Essayist's Comments on Contemporary Physic and Physicians; His Thoughts on Many Material Matters Relating to Life and Health; an Account of His Bodily Ailments and Peculiarities and of His Travels in Search of Health. By James Spottiswoode Taylor, Commander, M.C., U. S. Navy, M.D., F.A.C.S., Member Societe Francaise D'Histoire De La Medecine. 244 pages. Illustrated. New York: Paul B. Hoeber, 1923. Price, $3.75 net.

A biography of Montaigne, especially considered in its relation to medicine. Though naturally of a rugged physique, Montaigne suffered all the agonies incident to renal lithiasis and gout. The views of this man upon physicians and remedies and his sojourn at health resorts furnish a basis for this scholarly and intensely absorbing book.

Physics and Chemistry for Nurses. Lippincott's Nursing Manuals. By A. R. Bliss, Jr., A.M., Ph.D., M.D., Lecturer on Chemistry and Materia Medica, Grady Hospital Training School for Nurses, Atlanta, Ga.; Professor of Pharmacology, Emory University, School of Medicine; Passed Assistant Surgeon, U.S.P.H.S., Reserve; Formerly Professor of Chemistry and Pharmacology, Graduate School of Medicine, University of Alabama; and A. H. Olive, A.M., Ph.Ch., Ph.D., Lecturer on Chemistry, Hillman Hospital Training School for Nurses, Birmingham, Ala., Associate Roentgenologist, Hillman Hospital; Superintendent of University Free Dispensary, U.S.P.H.S. (State, County and City); Formerly Professor of Physics and Chemistry, Howard College; Associate Professor of Chemistry, Graduate School of Medicine, University of Alabama. With 190 pages and 70 illustrations. Third Edition, thoroughly revised and rewritten and conforming to the requirements of the Standard Curriculum (1922) of the National League of Nursing Education. Collaborators, Frances W. Witte, R.N.; Ethel Johns, R.N.; Sr. Mary Alma, Ph.G., R.N.; Alice L. Lake, B.S., R.N.; Stella Ackley, R.N.; Adelaide M. Leffingwell, R.N. With 190 pages, illustrated with 70 illustrations. Philadelphia and London: J. B. Lippincott Co., 1923.

The fact that examining boards for nurses now practically routinely include questions on physics and chemistry is one of the signs of the rising standard of efficiency among candidates for the position of registered nurse. The book gives an excellent summary of the information upon these subjects so essential to intelligent nursing.

Industrial Hygiene and Medicine. By E. W. Hope, O.B.E., M.D., D.Sc., Medical Officer of Health for the City and Port of Liverpool; Professor in Public Health, University of Liverpool; Late President, Society of Medical Officers of Health; and Late Examiner in the Universities of Belfast, Cambridge, Edinburgh, and Manchester, and to the Royal College of Physicians (Lond.) and Royal College of Surgeons (Eng.). In Collaboration with W. Hanna, M. A., M.D., D.P.H.; and C. O. Stallybrass, M.D., D.P.H., Assistant Medical Officers of Health, City and Port of Liverpool; and Lecturers in Public Health Subjects, etc., University of Liverpool. With 766 pages, illustrated. New York: William Wood & Co., 1923. Cloth, $7.00.

This book is based upon the knowledge of the causation of industrial disease and the preventive methods employed in the light of this knowledge. Industrial hygiene is one of the most fruitful fields of preventive medicine for the future, and only by the study of statistics concerning the diseases and accidents to which employees are liable can any workable means of prevention be found. This is a very carefully gotten up and valuable book.

Clinical Laboratory Methods. By Russell Landram Haden, M.A., M.D., Associate Professor of Medicine, University of Kansas, School of Medicine, Kansas City, Kan.; Formerly Director of Laboratories, Henry Ford Hospital, Detroit. 69 illustrations and 5 colored plates, 294 pages. St. Louis: C. V. Mosby Co., 1923. Cloth, $3.75.

The book is a selection of laboratory procedures which Haden has found most useful in his own experience. There is no originality claimed, but the volume is a good selection of laboratory procedures.

Essentials of Surgery, a Text Book of Surgery for Student and Graduate Nurses and for those interested in the care of the sick. Lippincott's Nursing Manuals. By Archibald Leete McDonald, M.D., the Johns Hopkins University, Formerly in Charge of Department of Anatomy, University of North Dakota; Lecturer on Surgery, Nurses Training School, St. Luke's Hospital, Duluth, Minn.; Member Western Surgical Association. With 292 pages and 40 illustrations. Second edition, revised. Philadelphia and London: J. B. Lippincott Co., 1923.

A thorough and accurate book containing information well selected for its intended readers.

Polaris, the Story of an Eskimo Dog. By Ernest Harold Baynes, Author of "Wild Bird Guests," etc. With many illustrations from photographs by Louise Birt Baynes, John R. Baynes, and the author. 137 pages. New York: The Macmillan Co., 1922. Cloth, $1.50.

This is a very charming little biography of a real dog, neither sentimental nor exaggerated, but interesting throughout. It is written about a dog whose parents were among those faithful animals who carried Admiral Peary's sledges over the northern ice and snow on his trip to the Pole. It is a fascinating biography of a noble animal.

The Biology of Death. Being a Series of Lectures Delivered at the Lowell Institute in Boston in December, 1920. By Raymond Pearl, of Johns Hopkins University. 275 pages. Philadelphia and London: J. B. Lippincott Co., 1922.

Although the title suggests that this may be another attempt at popular (which often means inaccurate) science, the content of the book is an agreeable surprise. It is a very scientific and clever assimilation of material from three sources: general biology, experimental biology, and statistical science, concerning our knowledge of natural death.

Other Books Received

The Propaganda for Reform in Proprietary Medicines. Vol. 2. 603 pages. Chicago: Press of American Medical Association, 1922.

Notes on Materia Medica, Pharmacology and Therapeutics for Dental Students and Practitioners. By Frank Coleman, M.C., L.R.C.P., M.R.C.S., L.D.S. Fifth Edition. 308 pages. New York: Oxford University Press, 1922.

Practical Physics. By J. A. Crowther, Sc.D., F.Inst.P., Sometime Fellow of St. Johns College, Cambridge; Demonstrator of Physics, Cavendish Laboratory; University Lecturer in Physics as Applied to Medical Radiology, Cambridge. 260 pages. New York: Oxford University Press, 1922.

Annual Report of the Surgeon-General of the Public Health Service of the United States for the Fiscal Year 1922. 330 pages. Washington: Government Printing Office, 1922.

A Manual of Surgical Anatomy. By Lewis Beesly, F.R.C.S., Edin., Surgeon, Chalmers' Hospital, Edinburgh; Lecturer on Surgery and Operative Surgery, Edinburgh School of Medicine for Women; Lecturer on Surgical Applied Anatomy, Edinburgh Post-Graduate Courses; Examiner in Anatomy, Royal College of Surgeons, Edinburgh; Lately Demonstrator of Anatomy, Edinburgh University. And T. B. Johnston, M.B., Ch.B., Professor of Anatomy, University of London, Guy's Hospital Medical School. Second Edition. 561 pages. New York: William Wood & Co., 1923.

The Riddle of the Rhine. Chemical Strategy in Peace and War. An account of the critical struggle for power and for the decisive war initiative. The campaign fostered by the great Rhine factories, and the pressing problems which they represent. A matter of pre-eminent public interest concerning the sincerity of disarmament, the future of warfare, and the stability of peace. By Victor Lefebure, Officer of the Order of the British Empire (Mil.); Chevalier de la Legion d'Honneur; Officer of the Crown of Italy; Fellow of the Chemical Society, etc. With a preface by Marshal Foch and an introduction by Field-Marshal Sir Henry Wilson, Bart., Chief of the Imperial General Staff. With 280 pages, illustrated. New York: E. P. Dutton & Co., 1923.

Impotency, Sterility, and Artificial Impregnation. By Frank P. Davis, Ph.B., M.D., ex-Secretary Oklahoma State Board of Medical Examiners; Formerly Superintendent, State Institution for Feeble-Minded; Author of "How to Collect a Doctor's Bill;" "The Doctor's Book of Poems;" Formerly Editor, Davis' Magazine of Medicine. Second edition, revised and enlarged, with 168 pages. St. Louis: C. V. Mosby Co., 1923. Cloth, $2.25.

Practical Anesthetics, for the Student and General Practitioner. By Charles F. Hadfield, M.B.E., M.A., M.D., Cambridge; Honorary Anesthetist, Prince of Wales Hospital, Tottenham; Assistant Anesthetist and Lecturer on Anesthetics, St. Bartholomew's Hospital; Late Anesthetist, City of London Military Hospital. 243 pages. New York: William Wood & Co., 1923. Cloth, $3.00.

Nursing and Nursing Education in the United States. Report of the Committee for the Study of Nursing Education. C. E. A. Winslow, Dr.P.H., Chairman; Mary Beard, R.N.; H. M. Biggs, M.D.; S. Lillian Clayton, R.N.; Lewis A. Conner, M.D.; David L. Edsall, M.D.; Livingston Farrand, M.D.; Annie W. Goodrich, R.N.; L. Emmett Holt, M.D.; Julia C. Lathrop; Mrs. John Lowman; M. Adelaide Nutting, R.N.; C. G. Parnall, M.D.; Thomas W. Salmon, M.D.; Winford H. Smith, M. D.; E. G. Stillman, M.D.; Lillian D. Wald, R.N.; W. H. Welch, M.D.; Helen Wood, R.N.; Josephine Goldmark, Secretary; and Report of a Survey, by Josephine Goldmark, Secretary. With 585 pages. New York: The Macmillan Co., 1923. Cloth, $2.00.

The New Physiology in Surgical and General Practice. By A. Rendle Short, M.D., B.S., B.Sc. (Lond.), F.R.C.S. (Eng.); Member of Council, British Association of Surgeons; Examiner in Physiology for the F.R.C.S.; Late Hunterian Professor of Royal College of Surgeons; Surgeon, Bristol Royal Infirmary; Lecturer on Physiology, University of Bristol. Fifth Edition, Revised and Enlarged. With 330 pages. New York: William Wood & Co., 1922. Cloth, $3.75.

Southern Medical News

DATE OF LOUISIANA MEETING CHANGED

The date of the annual meeting of the Louisiana State Medical Society has been changed to April 24, 25 and 26. Note the place and the time—New Orleans, April 24-26. The House of Delegates will meet on April 23.

ALABAMA

The annual meeting of the Alabama State Medical Association will be held in Mobile, April 17-20.

Drs. R. A. Smith and M. H. Hagood, Brewton, have recently opened a thirty-five bed hospital, known as Brewton Memorial Hospital. The institution is a two-story building.

Colbert County Medical Society has elected Dr. H. A. Griffith, President; Dr. G. F. Littlepage, Vice-President; Dr. E. T. Newsom, Secretary-Treasurer.

Madison County Medical Society has elected Dr. E. O. Williamson, Gurley, President, to fill the unexpired term of Dr. C. A. Grote, who resigned to go to Greensboro, N. C.

Capt. William M. Caffee, Manila, P. I., has resigned his commission in the M.C., U. S. Army, and will open offices in Birmingham.

Dr. Hugh C. McRee, Decatur, will succeed Dr. Burton F. Austin as Physician of Morgan County.

Dr. Burton F. Austin, Decatur, on his retirement as County Health Officer, February 1, was presented with a handsome gold watch and chain by members of the Morgan County Medical Society.

The State Department of Health is making an effort to establish full-time health units in every county of the State to aid in the spring campaign against mosquitoes. The insurance companies will cooperate with the U. S. Public Health Service in the fight against mosquitoes.

Dr. John L. Gallagher, Dora, has been appointed full-time Health Officer of Limestone County.

Deaths

Dr. J. R. Howell, Florence, aged 71, died January 24.

ARKANSAS

The annual meeting of the Arkansas State Medical Association will be held in Hot Springs May 2-4.

Chicot County Medical Society has elected Dr. S. W. Douglas, Eudora, President; Dr. E. E. Barlow, Dermott, Vice-President; Dr. J. S. Wilson, Lake Village, Secretary.

Franklin County Medical Society has elected Dr. Chas. S. Allen, President; Dr. H. F. Williams, Vice-President; Dr. Thos. Douglass, re-elected Secretary-Treasurer.

Jefferson County Medical Society has elected Dr. J. M. Lemons, President; Dr. W. T. Lowe, Vice-President; Dr. J. T. Palmer, Secretary-Treasurer.

White County Medical Society has elected Dr. R. L. Little, President; Dr. J. B. Havner, Vice-President; Dr. S. J. Allbright, Secretary-Treasurer.

The Stout Hospital, Brinkley, was formally opened January 18.

Dr. Rutial O. Norris, Tuckerman, has been appointed a member of the Board of Health to succeed Dr. Cyrus F. Crosby, Texarkana.

Dr. Henry Pace, Eureka Springs, has been appointed Health Officer to succeed Dr. C. F. Ellis, resigned.

Dr. Carle E. Bentley and Mrs. Katherine Oakman, both of Little Rock, were married February 10.

Dr. Erastus L. Miller, Crossett, and Miss Fannie C. Spurlock, Lake Village, were married February 13.

Deaths

Dr. Philip A. Conner, Whitton, aged 43, died January 30 from a bullet wound in the brain.

Dr. A. Neal Wood, Ashdown, aged 57, died December 15.

Dr. Henry B. Wiggs, Russellville, aged 49, died January 29 at Colorado Springs, Colo.

DISTRICT OF COLUMBIA

It has been announced that the sum of $25,000 has been pledged by the students of the Howard University School of Medicine, Washington, and a like sum by the administration, trustees and faculty of the University in the campaign to raise $250,000 by July 1 in order to receive the same amount from the General Education Board for the School of Medicine.

Representative Focht has introduced a bill in the House to provide for the erection of a building for the care of tuberculous pupils on the Upshur Street tract of land, Washington, at a cost of $150,000.

The American Child Health Asssociation, Washington, has been formed for the protection and promotion of child health in America. The association was formed by the amalgamation of the American Child Hygiene Association and the Child Health Organization and will have the full co-operation of the American Relief Administration, under the leadership of Herbert Hoover.

Deaths

Dr. George Woodruff Johnston, Washington, aged 64, died February 20 of heart disease while delivering an address.

Dr. Joseph Robert Lee Hardesty, Washington, aged 87, died February 3 from senility.

Dr. Charles William Franzoni, Washington, aged 85, died February 17 of bronchopneumonia.

FLORIDA

The annual meeting of the Florida State Medical Asssociation will be held in Jacksonville May 14-16.

Hillsborough County Medical Society has elected Dr. J. C. Dickinson, President; Dr. R. C. Hubbard, Vice-President; Dr. C. R. Marney, Secretary; Dr. J. C. Chandler, Treasurer.

Pinellas County Medical Society has elected Dr. Ralph D. Murphy, President; Dr. O. M. Knox, Vice-President; Dr. T. R. Griffin, Vice-President; Dr. O. O. Feaster, Secretary; Dr. G. M. Lochner, Treasurer.

Included in the bond election soon to be held in St. Petersburg is an item of $150,000 for an eighty-bed addition to the City Hospital.

Deaths

Dr. Clarence M. Slack, St. Petersburg, aged 81, died January 28 from senility.

Dr. Joseph Palmer Johnson, Lynn Haven, aged 84, died December 9 from senility.

Dr. James Massey Jones, Interlachen, aged 79, died February 12 from senility.

GEORGIA

The annual meeting of the Georgia State Medical Association will be held in Savannah, May 2-4.

Ben Hill County Medical Society has elected Dr. W. D. Dorminy, President; Dr. L. E. Thornton, Vice-President; Dr. W. P. Coffee, Secretary-Treasurer.

Carroll County Medical Society has elected Dr. C. C. Fitts, President; Dr. H. J. Goodwyn, Vice-President; Dr. D. S. Reese, Secretary-Treasurer.

Fulton County Medical Society has elected Dr. H. R. Donaldson, President; Dr. W. E. Person, Vice-President; Dr. Grady E. Clay, Secretary-Treasurer.

Hall County Medical Society has elected Dr. J. L. Meeks, President; Dr. R. L. Rogers, Vice-President; Dr. Pratt Cheek, Secretary-Treasurer.

Irwin County Medical Society has elected Dr. H. P. Lyons, President; Dr. R. F. McLeod, Vice-President; Dr. L. L. Whiddon, Secretary-Treasurer.

Lowndes County Medical Society has elected Dr. G. T. Crozier, President; Dr. D. W. Freeman, Vice-President; Dr. T. H. Smith, Secretary-Treasurer.

Pike County Medical Society has elected Dr. J. C. Beauchamp, President; Dr. D. L. Head, Vice-President; Dr. M. M. Head, Secretary-Treasurer.

Stewart-Webster County Medical Society has elected Dr. J. M. Kenyon, President; Dr. J. H. Foster, Vice-President; Dr. W. F. Walker, Secretary-Treasurer.

Tri-County Medical Society has elected Dr. J. L. Cheshire, President; Dr. W. C. Hays, Vice-President; Dr. C. K. Sharp, Secretary-Treasurer.

Dr. Victor H. Bassett, Savannah, who it is alleged was dismissed from the position of Director of the Hygienic Laboratory of the Board of Sanitary Commissioners of Savannah for refusing to pay political assessments, has been restored to his position, and has in addition been made Acting Health Officer of the City during the reorganization of the Health Department. It is proposed to hold a competitive examination for the positions of Health Officer and Supervisor of Public Health Nurses and to place the positions permanently out of politics.

Dr. Alfred F. White, Flovilla, has been elected President of the State Medical Board.

Dr. Bracken, Surgeon in charge of Ashbury Veterans' Hospital, Minneapolis, Minn., has been transferred to the Government Hospital, Atlanta.

Dr. T. F. Harper, Coleman, President, Randolph County Medical Society, has left Coleman to locate in Newman, Ga.

Dr. J. H. Chandler, Swainsboro, has been elected City Physician.

Dr. Richard L. DeSaussure, Brunswick, has resigned as County Health Commissioner of Glynn County and has accepted a similar position in Ohio.

Dr. Lonnie Woodfin Grove and Miss Dorothy Haverty, both of Atlanta, were married January 19.

Dr. Henry Taylor Compton and Miss Sarah Millburn Walthour, both of Savannah, were married January 24.

Deaths

Dr. William H. Crow, Pavo, aged 52, died February 4 at Sylvester from injuries sustained in an automobile accident.

Dr. Paul Tudor Jones, Columbus, aged 71, died February 9.

Dr. Thomas Hartley Hall, Dublin, aged 85, died February 12 from senility.

Dr. Daniel Hughes DuPree, Athens, aged 39, died February 22 from angina pectoris.

Dr. Henry Latimer Rudolph, Gainesville, aged 43, died January 28 from pneumonia.

Dr. Thomas J. Kennedy, Coolidge, aged 60, died February 8 from heart disease.

Dr. Charles P. Brightwell, Maxeys, aged 47, died December 25 from influenza.

KENTUCKY

At the recent annual meeting of the Kentucky State Board of Health, held in Louisville, the following appointments were made: Dr. Philip E. Blackerby, Director of the Bureau of County Health Work; Dr. Lillian H. South, Director of the Bureau of Bacteriology and Epidemiology; Dr. John S. Lock, Director of the Bureau of Tuberculosis; Dr. Annie Veech, Director of the Bureau of Child Hygiene; Dr. Jethra Hancock, Director of the Bureau of Venereal Disease; Dr. Charles B. Kobert, Director of the Bureau of Trachoma and Conservation of Vision; Dr. Samuel W. Bates, Superintendent of the State Tuberculosis Sanatorium, Hazelwood; Dr. Frank J. O'Brien, Director of the Bureau of Mental Hygiene, and Miss Williamson, Director of the Bureau of Public Nursing.

Dr. William H. Coffman, Georgetown, has been elected President of the Scott County Board of Health.

Free physical examinations will be given to many thousands in Louisville under supervision of the faculties of the medical and dental colleges of the University of Louisville. The work will be done through the co-operation of the University officials with the Jefferson County Medical Society and the county dental society.

A "Habit Clinic," the second of its kind in the United States, has been established by the Psychological Clinic in Louisville, under the supervision of the Louisville Society for Mental Hygiene. The Clinic is for children of preschool age who show pernicious habits which, if unchecked, may become serious. The first clinic was established in Boston in 1922.

The County Tuberculosis Hospital, Henderson, which has been thoroughly remodeled and furnished with new equipment, was reopened January 17.

Tuberculosis clinics will be held in twenty counties in the State, as follows: Rockcastle, Lincoln, Fulton, Graves, Scott, Johnson, Bourbon, Grayson, Daviess, Mason, Montgomery, Clark, Mercer, Boyle, Pulaski, Henry, Laurel, Hopkins, Christian and Knott.

The Health Department of the Woman's Club, Fulton, has inaugurated a campaign to raise funds which will be expended in equipping a public clinic in Fulton, where children of school age and under, whose parents are unable to pay for necessary dental or surgical treatment, can be treated free of charge. The clinic will, in a measure, take the place of a municipal hospital.

Oldham County Health Board is composed of the following members: Dr. R. B. Cassady, Dr. E. F. Weeks, Dr. H. B. Blaydes, Dr. R. B. Pryor and County Judge A. T. Ladd. Dr. Cassady is County Health Officer and is Chairman of the Board.

Establishment of permanent headquarters of the National Health Exposition Association in Louisville was recently announced. The Association was formed by a group of state and city health officials to conduct health expositions along ethical lines and eliminate promotional methods and profits from such enterprises. The organization will maintain a permanent staff and its personnel will be sent to various cities whenever required. Dr. Geo. Parrish, Portland, is First Vice-President; Dr. Hiram Read, Seattle, Second Vice-President; Mr. R. E. Logsdon, Secretary-Treasurer. Members of the Advisory Council are: Dr. L. M. Powers, Los Angeles; Dr. H. L. Sayler, Des Moines; Dr. F. W. Almond, Boise, Idaho; Dr. R. C. Turck, Jacksonville, Fla.; Dr. Thomas Tetreau, Portland, Me.; Dr. Rodney Fagen, Des Moines; Dr. W. M. Dickie, Sacramento, Calif.; Dr. R. M. Olin, Lansing, Mich.; Dr. W. S. Rankin, Raleigh, N. C.; Dr. E. G. Williams, Richmond, Va.; Dr. S. J. Crumbine, Topeka; Dr. J. D. Dowling, Birmingham, Ala.; Dr. Oscar Dowling, New Orleans; Dr. S. W. Welch, Montgomery, Ala.; Dr. C. C. Slemons, Grand Rapids; Dr. W. S. Leathers, Jackson, Miss.; Dr. Charles Duncan, Concord, N. H.; Dr. I. H. Dillon, Lincoln, Neb.; Dr. W. C. Fowler, Washington, D. C.; Dr. Henry R. Vaughan, Detroit; Dr. C. W. Garrison, Little Rock.

A Health and Welfare League for Grayson County was recently organized.

Rowan County Health Board is composed of the following members: Dr. A. W. McClease, Health Officer; J. W. Riley, Chairman; D. B. Cornett, Morehead; Dr. J. Vinton Messer, Bluestone; Dr. Samuel Porter, Vale.

The Central Division of the American Roentgen Ray Society, at the recent meeting in Louisville, elected the following officers: Dr. D. Y. Keith, Louisville, President; Dr. W. O. Upson, Battle Creek, Mich., First Vice-President; Dr. Charles Goosman, Cincinnati, Ohio, Second Vice-President; Dr. R. C. Beeler, Indianapolis, Ind., Treasurer. The next meeting will be held in Indianapolis.

Dr. C. M. Rice, Sutherland, has been appointed a member of the Daviess County Health Board, succeeding Dr. M. H. Walker, resigned.

Dr. Frederick J. Hoitash and Miss Agnes Maria Stadler, Ashland, were married February 24.

Deaths

Dr. J. H. Forest, Murray, aged 68, died December 11 from pneumonia.

Dr. W. H. Conway, Covington, aged 79, died February 5.

Dr. Frank C. Simpson, Louisville, aged 65, died February 25 from pneumonia.

Dr. Thomas P. Caldwell, London, aged 82, died February 26.

Dr. George Hinkle, Sanders, aged 40, died February 6 from influenza.

Dr. J. M. Williams, Pikeville, was shot and killed early in February.

Dr. John W. Williams, Olive Hill, aged 80, died February 8 from heart trouble.

Dr. J. C. Wood, Bardstown, aged 88, died March 6.

LOUISIANA

The annual meeting of the Louisiana State Medical Society will be held in New Orleans April 24, 25 and 26—note change in date. The House of Delegates will meet on April 23.

Dr. Oscar Dowling, President of the State Board of Health, was a member of a party of prominent physicians and surgeons who recently were on a cruise to Central and South America. He was one of the Committee at the laying of the corner-stone of the Gorgas Memorial Institute of Tropical Medicine in the City of Panama, February 18. Dr. Belisaio Porras, President of the Republic of Panama, gave the chief address on this occasion.

The Public Health Hospital, Shreveport, was closed February 10. It was the last of its kind in the United States.

On May 12, National Hospital Day, a state-wide campaign to collect $400,000 for the Charity Hospital, New Orleans, will be inaugurated.

Dr. J. G. Yearwood, Caspiana, has been elected Health Officer for Caddo Parish.

Dr. L. R. DeBuys, Professor of Pediatrics, Tulane University of Louisiana, New Orleans, was recently elected a member of the Board of Directors of the American Child Health Association.

Dr. Rudolph Matas, New Orleans, has been elected a member of the Royal Academy of Barcelona, Spain, also corresponding member of the Societe de Chirurgie at Paris.

Deaths

Dr. Jacob D. Graybill, New Orleans, aged 74, died February 1.

MARYLAND

The annual meeting of the Medical and Chirurgical Faculty of Maryland will be held in Baltimore April 24-26.

In the February issue of the JOURNAL, under this heading, we stated that "Dr. Keith Rice has been appointed by the staff of Johns Hopkins Hospital, Baltimore, as Assistant Resident Surgeon in the Church Home Infirmary, a branch of Johns Hopkins." The JOURNAL was in error, as

(Continued on page 36)

SOUTHERN MEDICAL JOURNAL

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

AN ANATOMICAL STUDY CONTRASTING THE DEMENTIA PRECOX CONSTITUTION WITH THAT OF PARANOID DEVELOPMENTS*

By Nolan D. C. Lewis, M.D.,
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Washington, D. C.

While the determining factors in operation as well as the symptomatic expressions in these two major mental disorders are considered by most investigators to be quite distinctive, there is sufficient overlapping or combination of objective features to have created the diagnostic appellation "paranoid dementia precox" of Kraepelin, which term, at least in some psychiatric centers, now enjoys the popularity and frequent use once afforded paranoia and later dementia precox.

It is with the idea of throwing some light upon the fundamental constitutional make-up of these two groups which overlap clinically at one point that I shall review briefly the results of my recent researches in the anatomopathologic field.

Notwithstanding the diversity of opinion of the various schools of psychology and psychopathology regarding the mechanisms or factors operative in the development of the state known as the dementia precox constitution, there are some descriptive characteristics to which all are agreed. (1) That there exists a basic constitutional or organic (probably hereditary) factor or factors which at different times have been considered anatomic, metabolic, bacterial, endocrine, etc. (2) The majority of onsets occur early in life, at puberty or shortly after. (3) There is a high incidence of pulmonary and other forms of tuberculosis, which is the terminal lesion in about 85 to 90 per cent of these cases.

During the past eight years, in going over the material from autopsies on the mentally disordered, I have sought to discover a fundamental reason for the above facts and have been particularly impressed by the frequency of developmental and acquired peculiarities in their circulatory and endocrine systems.

The procedure and results of this investigation are given in considerable detail in the forthcoming monograph under the title of "The Constitutional Factors in Dementia Precox with Particular Attention to the Circulatory System and to Some of the Endocrine Glands," to be published in the "Nervous and Mental Monograph Series" (Monograph No. 35). Time will here allow for only a brief description of the most important findings.

One group of 601 cases of dementia precox coming to autopsy was examined as to the anatomical construction, and another smaller group composed of 22 unselected cases, representing all cases of this disorder coming to post mortem during eight months, was also examined from

*Read in Section on Neurology and Psychiatry, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

TABLE I.—COMPARING TWENTY-TWO CASES OF

Case No.	Age at Death		Sex		Duration of Psychosis		Heart Weights		Cause of
	D. P.	P.	D. P.	P.	D. P.	P.	D. P.	P.	Dementia Precox
1	32	48	M.	M.	2½	4	160	460	Pulmonary Tuberculosis
2	30	66	M.	F.	6	15	250	520	Pulmonary Tuberculosis
3	26	51	M.	M.	5	?	320	460	Pulmonary Tuberculosis
4	40	67	M.	M.	11	4	220	530	Pulmonary Tuberculosis
5	20	54	M.	M.	2	5	250	340	Pulmonary Tuberculosis
6	30	50	M.	M.	2	15	380	430	Hemorrhagic Pneumonia
7	40	52	M.	M.	12	32	250	675	Pulmonary Tuberculosis
8	27	73	M.	M.	3½	26	200	470	Pulmonary Tuberculosis
9	49	68	M.	F.	17	35	280	420	Septicemia
10	32	52	M.	M.	6	12	380	740	Cardio Vascular
11	45	67	M.	M.	21	67	200	350	Pulmonary Tuberculosis
12	25	80	M.	M.	3	20	390	400	Pulmonary Tuberculosis
13	28	68	M.	M.	3	31	250	290	Uremia
14	32	75	M.	M.	5	37	200	400	Influenza
15	28	60	F.	M.	7	5	180	190	Intestinal Obstruction
16	37	53	M.	M.	½	15	240	420	Lobar Pneumonia
17	29	61	M.	M.	17	2	330	600	Pulmonary Tuberculosis
18	54	66	M.	F.	1	10	150	360	Uremia
19	51	....	M.	....	20	....	480	.....	Multiple Serositis
20	38	....	M.	....	12	....	260	.....	Pulmonary Tuberculosis
21	34	....	M.	....	10	....	270	.....	Congenital Megacolon
22	25	....	M.	....	26 da.	....	200	.....	Hirntod

this standpoint, and in addition the major endocrine glands were studied in detail. It was apparent that one of the chief differences from the anatomic viewpoint between this group and other mental disorders was in the circulatory and lymphatic systems, and evidence was obtained strongly indicating that this difference was a fundamental one: that is, that it was a part of the organization at birth, not acquired unless very early in life and not the product of, or influenced profoundly by, prolonged visceral disease.

The average weight of the dementia precox heart is one-third less than the normal or average, the small size being independent of race, age, sex, size of body, duration of psychosis, or lethal lesion. It stands out in considerable contrast with the other mental disease groups. The decrease in size is of the nature of an aplasia or arrest in growth, since the well known pathologic signs of atrophy are as often absent as present. The valves are normal developmentally and free from lesions, and although occasionally secondary atrophy in the muscle is present, the original arrest in growth is indicated by the small aorta with its correspondingly small branches. This type of circulatory system retains its small proportion throughout life and lacks the capacity to develop a true compensatory hypertrophy. The walls of the congenitally small aorta are always thin, smooth, free from lesions and usually hyperelastic. This state of affairs along with the widened bed of the lymphatic stream, although not associated with all of the features of the status lymphaticus syndrome, may suggest the larval state of this disorder.

In the gonads I found the same three stages of regressive atrophy described by Mott and his associates, but I have to differ with them in one respect in that I found no correspondence between the degree of regressive atrophy of the testes and the duration of the mental symptoms, since some of the most profound changes were in the organ of those with psychoses of short duration.

In these cases I have found pronounced alterations in the adrenal cortex to be fully as constant a feature as regressive atrophy of the testes. In general the cortex is thin, the three histologic zones being narrow and ill-defined. The stroma is always abundant with definite sclerosis of the zona glomerulosa. The medulla does not always share the atrophy, but may be normal or hypertrophied. In 50 per cent of the cases there was a definite arrest in the cortical development. Accessory adrenals were frequently found in the dementia precox group.

The thyroid gland has been found altered in its connective tissue and colloid structures in such a manner as to suggest a functional association with the genital glands. Various degrees of endosclerosis with marked losses in colloid which have been proven to be independent of other

DEMENTIA PRECOX WITH EIGHTEEN OF PARANOIA

Death	Blood Vessels		Type	
Paranoid	D. P.	Paranoia	Dementia Precox	Paranoia
Fibrinous Pericardia	Small	Sclerotic	Hebephrenic	Par. State
Multiple Aneurysm	Small	Sclerotic	Hebephrenic	Par. State
Aortic Aneurysm	Normal	Sclerotic	Hebephrenic	Par. Precox
Cardiac Decompensation	Normal	Sclerotic	Hebephrenic	Par. Precox.
Cardiac Decompensation	Small	Sclerotic	Hebephrenic	Par. Precox.
Aortic Aneurysm	Small	Sclerotic	Hebephrenic	Par. Precox.
Cardiac Decompensation	Small	Sclerotic	Hebephrenic	Par. Precox.
Cerebral Hemorrhage	Small	Sclerotic	Catatonic	Alcoholic Par.
Cerebral Hemorrhage	Small	Sclerotic	Catatonic	Par. State
Cerebral Hemorrhage	Small	Sclerotic	Catatonic	Par. State
Aortic Aneurysm	Small	Sclerotic	Catatonic	Alcoholic Par.
Aortic Thrombosis	Small	Sclerotic	Catatonic	Par. State
Cardiac Decompensation	Small	Sclerotic	Catatonic	Par. State
Aortic Aneurysm	Small	Sclerotic	Catatonic	Essential Par.
Cerebral Thrombosis	Small	Sclerotic	Catatonic	Par. State
Celebral Hemorrhage	Small	Sclerotic	Catatonic	Par. Precox.
Cerebral Hemorrhage	Small	Sclerotic	Hebephrenic Alc.	Par. Precox
Hemorrhagic Pneumonia	Small	Sclerotic	Mixed Alcohol	Par. Precox
.....	Diseased	.....	Mixed Alcohol	.....
.....	Diseased	.....	Mixed Alcohol	.....
.....	Diseased	.....	Hebephrenic	.....
.....	Diseased	.....	Acute Catatonia	.....

factors is a characteristic finding, and moreover the scleroses do not conform to descriptions of the "senile type" of gland.

Directing our attention now to the paranoid developments, we are obviously dealing with a much smaller group of individuals, and one in which an opportunity is rarely available to investigate the physical components of the condition in its early stages. These individuals usually live for a number of years, apparently living out the life span and deteriorating late in life, a deterioration which is perhaps slightly presenile in the average case. When the opportunity comes for post mortem there is the probability of finding such changes as were once prominent to be partly or wholly obscured by senile changes in the tissues. However, in my group of cases comprising 18 paranoid developments among the diagnostic appellations of which were paranoid state, alcoholic paranoia, paranoia, and paranoid dementia precox, there were tissue changes quite characteristic of the group which differentiated it from seniles and arterio-sclerotics on one hand and from the dementia precox group on the other.

In the first place, very few of the paranoids died from tuberculosis and none in my group was seriously affected with this disease. They do succumb from vascular accidents and so prevalent are these accidents among the paranoids that almost all cases die with cerebral hemorrhage, ruptured aneurysms, or cardiac decompensation. The circulatory systems of these individuals are markedly in contrast with those of dementia precox, as is demonstrated in Table I. The heart weight is greater because of the incidence of compensatory hypertrophy, and also the arterial system as a whole is larger in caliber.

Associated with these compensatory reactions through the circulatory system, we find in the thyroid gland an atrophy with colloid destruction and a fibrosis which is patchy in type, these patches very often alternating with areas of compensatory glandular reaction, frequently to the extent of adenomatous proliferations. In some of the other thyroids of this group we find very little colloid reduction, but very marked hyperplasias with general overgrowth of the epithelioid cells.

The adrenal glands are quite in contrast to the dementia precox cortex, a widened structure which is developmentally large and which later may have undergone secondary disease alterations. Still in patches we find compensatory glandular reactions in certain areas, in that there is an increase in the number of cortical cell columns, sometimes to the extent of an adenoma. The medullary portions were also occasionally hyperplastic.

The gonads show some interesting features in contrast to the dementia precox testicle so well described by Mott and others, in that we find here areas of tubular atrophy, alternating with normal areas,

TABLE II.—COMPARING DEMENTIA PRECOX WITH PARANOID DEVELOPMENTS

Tissue	Dementia Precox	Paranoid
Brain	Organic changes described by Southard and others. Personal findings in blood vessels and lymph spaces	Some organic changes. Nothing characteristic
Circulatory System	Larval status lymphaticus. Aplasia. Lack of true hypertrophy. Hypertrophy of lymphatics	Compensatory enlargement. Circulatory accidents. Normal lymph glands.
Pituitary	Regressive—Basophilic cell reactions	Fusion of cells. Compensatory hypertrophies. Focal distribution.
Thyroid	Regression enderosis	Compensation epithelial hyperplasias. Focal.
Adrenal	Aplasia of cortex. Accessory glands	Wide cortex—unusual hyperplasia (focal)
Gonads	Regressive atrophy. Fibrosis	Focal atrophy. Normality. Focal hyperplasia.
Lungs	Tuberculosis (large percent)	Tuberculosis rare. Interstitial pneumonia
Prostate	Fibrosis regression.	Hyperplasia—glandular and fibrous enlargement. Frequent malignancy
Malignancy	Rare	Frequent
Onset	Early	Not characteristic
Deterioration	Early—characteristic	Slow. Slightly presenile
Mechanism	Introversion. Regression to autoerotic level	Projection. Compensation. Regression to homosexual and narcissistic spheres

with hyperplastic tubules, and sometimes with hyperplastic areas of adenomatous nature. Thus it appears that all through the endocrine glands of the paranoid group there are reactions on the part of the tissue to compensate for focal defects, probably indicating attempts to maintain a certain level of functional existence. Frequently in the other tissues of those dying in paranoid states we find evidence of compensatory reaction, this being particularly well shown in the tendency to blood vessel proliferation, miliary angiomata, prostatic hypertrophy, carcinomata, and liver cell hypertrophy.

Since the so-called paranoid dementia precox presents the reaction mentioned above, this type should be placed definitely in the group of paranoid developments and the term "precox" should be dropped. This constitution is in no way like that of the hebephrenic and catatonic types first mentioned, where the secondary tissue reactions are regressive in nature and where there is a primary hypoplasia of the circulatory system in contrast with the compensatory type of circulatory system of the paranoid developments which usually ends in rupture from over-compensation, or from cardiac decompensation.

In contrast to the type of conduct and regression to the autoerotic level of development found in the majority of hebephrenic and catatonic precox states with their aplastic circulatory apparatus and defective endocrine glands, are the paranoid compensatory reactions (including "paranoid dementia precox") where there is a better preservation of the personality, an interest in the outside world, more harmony between ideas and mood and less tendency to deteriorate. The tissues of the body participate in this preservation by compensatory growth changes. (See Table II.)

In this short paper, which is based upon two large researches to be published in monograph form, it has been necessary to make statements of findings and to leave out the methods by which the deductions have been drawn. It is hoped to stimulate an interest in those who have to do with the diagnosis and sizing up of the various personality types.

DISCUSSION

Dr. Beverley R. Tucker, Richmond, Va.—The arrested development of the circulatory apparatus in dementia precox is interesting and important and brings to the clinical mind two questions: first, are the brains of dementia precox subjects lacking in weight as are the hearts?

Second, could the changes found in dementia precox be the result of the mental state rather than the cause of it? I hope that Dr. Lewis will give us information upon the comparative brain and heart weights and also let us have his opinion upon the second question. It would seem possible that the early mental sluggishness and regression of dementia precox might cause lack of development in the heart, the lymphatics, the thyroid, the suprarenal cortex and the gonads, or that the state, dementia precox, might result from the arrested development of these organs, but, to my mind, there is still an undiscovered factor which will be found to account for both, and this factor must lie buried deep in the realm of biochemistry.

A small heart may or may not mean a lessened cerebral blood supply. Simple thyroid inadequacy could not account for the mental phenomena of dementia precox. Lack of initiative and energy might be part of a suprarenal syndrome, but not all of it, and even preadolescent eunochism is not the picture of dementia precox. Nor, do I think, would all of these combined spell dementia precox.

If one thinks of the mind as the secretion of the brain, then one must look to this organ itself, or definite nutritional, toxic or other chemical effect upon the brain, to account for the disease. As I understand it, the brain is not grossly defective in dementia precox, and for this and other reasons dementia precox should not be put in the category of, let us say, feeble-mindedness. We know of no nutritional or toxic cause for the condition and so, by elimination, our best guess is some chemical protoplasmic change which would affect the brain and other organs and tissues involved.

The same argument also pertains to paranoia, except that the substance or change, whatever it may be, appears, as Dr. Lewis has shown, to have a rather stimulative than a retardative effect upon the tissues of certain organs.

Dr. T. A. Williams, Washington, D. C.—The Section is lucky to be the first to hear an account of so extensive a research as this, which is revolutionary in character. It is the kind of work that one would expect to be presented first to the American Psychiatric Association, or the American Neurological Association, or to some body even more select from the point of view of research study.

In whatever respect one may modify Dr. Lewis' conclusions, the fact stares one in the face that there is no such condition as dementia paranoides. The ideas of Kraepelin will have to be revised.

Has Dr. Lewis any theory as to why all cardio-circulatory hypoplasia individuals do not develop dementia precox? We see a number, and the internist sees a number, of individuals with congenital hypoplasia of the vascular system who are not psychotic at all.

In watching the slides I was struck with the extreme shortness of the aorta in the dementia precox individual. Does that correspond to shortness of back, or is it a disproportion between the aorta and the length of the thoracic spine? If Dr. Lewis' inferences are borne out, we shall be in a position to say that only cases with congenital vascular and glandular hypoplasia type, such as he has shown us, are entitled to the designation dementia precox, and that the patients who show precox reactions and do not possess this type of constitution have some other condition. That can only be a clearer formulation and more exact way of defining what we have all found, namely, that a great many patients who on first view are designated under dementia precox are probably not entitled to that designation. They get well. They are toxic infectious cases, or toxic upsets in psychopaths.

How is it, also, that patients with hypotension are of the lymphatic type? I cannot say congenital hypoplasics as regards their system, because I do not know. Patients who seem to be rather of that type often present themselves to us, whom we regard as of the paranoid type. Now, we must think of them in connection with Dr. Lewis' conception of the foundation of paranoia.

We might formulate hypothetically interpretated anatomical data before us in this way: the congenital hypoplastic and hypo-endocrine individual receives an insult, whether it is a chemical or a dynamic insult, that we call psychiatrical, and he finds himself unable to respond to the extra effort required to deal with that situation. He has not the kinetic drive. His circulatory system is inadequate. He advances by lapsing into autistic intellection. He does not react as the hyperesthenic individual with strongly developed glandular system and powerful circulation can react. When he has some insult he has a violent asthenic reaction which shows in his action in the psychological sphere and shows itself as a form of thinking which we have called autistic too loosely. In this there is reaction to environment potentially which often leads to the kind of deeds performed by the paranoiacs. I simply throw that out as a hypothetical correlation between anatomical data and conduct disorders.

Dr. R. C. Swint, Milledgeville, Ga.—The impression we get from the dementia precox constitution is that the individual is susceptible to constitutional diseases, and that he may have an inferior or abnormal constitutional make-up.

Dr. R. M. Chapman, Towson, Md.—Pathologists have not been furnishing us with very much new information in recent years, and clinically we have turned to psychological conceptions as affording us, for the time being at least, better avenues of approach to the problems of our patients. But we are going to find more satisfactory anatomical bases for the major psychoses. Dr. Lewis has accomplished a great deal in giving us new lines along which to work.

I should like to know more as to the Doctor's reasons for considering these changes, the reduced size of the heart, the lessened size of the vessels, the glandular changes, etc., as primary rather than secondary. We shall look forward

with interest to Dr. Lewis' correlation between symptomatology and his anatomical findings.

Dr. J. W. Quillian, Chattanooga, Tenn.—Buckle, in his "History of Civilization," made this statement: that the greatest man that ever lived was Bichat. If you ask the ordinary man who Bichat was, he has not much chance of being able to give you an answer. He was a great investigator in anatomy and physiology, who used all the means at his disposal, but had no laboratory facilities. What he saw and said, which looks to be prophetic, was that the behavior of the individual depends upon the texture of his tissues. That is just what Dr. Lewis has told us today.

In every form of mental trouble there is, I feel, a pathologic or physiologic basis plus the common environmental influence. Our terminology is not exact because we are not dealing like engineers with mathematical propositions, and our knowledge of mentality is something more intricate than any of the other sciences that has ever been presented to us.

Take a case of dementia precox. Like Dr. Lewis, I do not like the term. It does not mean anything, because we see these precox cases even in advanced life. Some of the cases I have seen have been perfectly constructed individuals. Such a case I saw in a young man recently, about 19 years of age. He had a perfect anatomical development and a great athletic record. Doubtless, if we had gone into the pathology of his glands we should have found the explanation.

A duty that we ought all to perform is, whereever possible to have a post mortem investigation.

Dr. Lewis (closing).—Many of the questions offered in the discussion have been answered from my own standpoint in the original work. I am willing to change my opinions at any time should some one formulate a theory which will better fit the facts. Granting that I have given a certain number of facts, it is rather unfair to you to attempt to describe in so short a time a piece of work which covers 450 pages of printed material. Relative to the comparative size of the other organs, particularly the brain, in comparing those organs with a large number (about 100 in each group) of types of mental disorders, I have found that there is practically no difference in the actual sizes and weights of the general organs; that is, the average manic-depressive runs about the average of dementia precox cases so far as the weight of the kidneys, liver and brain are concerned. That was discovered a long time ago. As to the explanation, I think of it in these terms: the circulatory system is one of the earliest developments in the embryo and it is actively at work in early intra-uterine life. If we consider the statistics on heart weights we find that the average heart (male) weight is given as 300, 320 or 350 grams. Probably 300 grams should be taken as the average. While in 600 dementia precox cases the heart averages only 256 grams or something like that. In a large number of them it was around 250 grams, 33 1/3 to 40 per cent decrease in size. Any such undersize amounts to something in an active somatic organ like the heart, with the correspondingly small vessels. The circulatory system furnishes nutrition to every organ. However, if one sits on a bench or pursues some pleasure with no constructive mental or physical work, the small circulatory organization will supply sufficient nutrition for the organs to grow, so far as normal size is concerned. However, at any time that the individual makes an attempt to do constructive physical or mental work, the organs cannot meet the functional situation because of insufficient nutrition. Whether underneath all this we have some biochemical change which will account for the arrest of development of the heart, I do not know. The investigation of large groups of cases is necessary to elaborate these points.

It has been my observation that a precox patient with rheumatic endocarditis or from other infections may get hypertrophy of the heart, but the small aorta attached to it indicates the original underdevelopment.

In answer to Dr. Chapman's question as to which is fundamental, the mental regression or the physical defect, I feel that we should look at the patient from the same standpoint that we do in internal medicine. We do not look upon fever as being the cause of infection, and so on. If we look at it clinically the physical defect must be more fundamental.

I have a few cases of the rapidly developing type of reactions which we call acute catatonia. They last only a few days. The acute catatonic outbreak ends in hirntod and early death. Here we have circulatory and glandular changes similar to those found in the more advanced precox cases.

Regarding the type of case mentioned by Dr. Williams, I prefer to classify it under the term schizophrenia, which reaction may be more or less temporary and produced by complicated situational or environmental factors. I would reserve the name dementia precox for the type of cases implied by the term. Not all schizophrenics have the dementia precox type of constitution, but most precox patients show schizophrenic features at some time during the disorder.

LIPODYSTROPHIA PROGRESSIVA: A REPORT OF TWO CASES, ONE OF WHICH SHOWED IMPROVEMENT UNDER MEDICAL TREATMENT*

By Thomas P. Sprunt, M.D.,
Baltimore, Md.

This interesting condition was first described by Barraquer, in Barcelona, in 1905, by Campbell, in London, in 1907, and was more thoroughly studied, in 1911, by Simons, who gave it the name, "lipodystrophia progressiva." About seventy cases have been recorded. It is characterized by a remarkably complete disappearance of the subcutaneous fat of the face, of the neck and usually of the arms and upper portion of the trunk. This emaciation begins as a rule in childhood, first involves the face and then the lower parts progressively from above downward. Simultaneously or beginning a few years later, there is an excessive deposit of subcutaneous fat on the lower portion of the trunk, about the gluteal regions and on the legs, which may be in grotesque contrast with the emaciation above the waist.

The patients complain of various symptoms: weakness, lack of appetite, fatigability and especially of the disfigurement which, in view of the fact that almost all of these patients are girls or women, is the more important.

The soft parts other than the adipose tissue are not affected nor is the underlying bone involved, in contradistinction to the so-called facial atrophy which must sometimes be considered in the differential diagnosis. The muscular system may be very well developed and frequently stands out prominently almost as in a dissection, owing to the thinness of the covering tissues. In the face the bony prominences are conspicuous, the orbicularis oris muscle is shown clearly and the zygomatic muscle separates a deep hollow above from a similar one below. When the patient smiles the skin of the face is thrown into deep folds. It is interesting that the fat of the orbits usually escapes and that the tongue is not affected. Sections through the skin and subcutaneous tissues show a loss of fat much more nearly complete than in any of the so-called wasting diseases, e. g., tuberculosis, cancer, etc.

The general health is sometimes described as good, but is more frequently modified by functional nervous disturbances.

Our first case, O. H., came to Dr. Barker's private clinic complaining that she was excessively thin and wished to know why. She said that she was thin only above the waist and had been so since the age of seven or eight. She thought the process began in the winter or spring without known exciting cause, and had advanced to such an extent by the fall that her parents were worried and took her to a physician. A number of diseases were suspected, including rickets and tuberculosis, but no satisfactory diagnosis had ever been made. Other lifelong symptoms were nervousness, anorexia, fatigability and slight palpitation.

A synopsis of the examination follows:

O. H. was 27.

Chief complaint was that she had been thin above the hips since the age of 8.

Her habits were good.

She had had measles at 5 or 6; chicken pox at 7; tonsillitis and influenza, and no operations except tonsillectomy in 1916.

Respiratory System.—X-ray of the sinuses was clear. There was a slight nasal obstruction on the right side. The lungs were normal by physical examination and x-ray.

Circulatory System.—Blood pressure 100/64, 116/60; heart of pendulous type; and pulse 80.

Blood and Hematopoietic System.—R. B. C., 4,784,000; Hb., 90; W. B. C., 6600; WaR., 0; PMN., 46.8; PME., 2.8; Sm., 39.6; and L. M., 10.4. There was no general enlargement of the lymph nodes. The spleen was not felt.

Digestive System.—Free HCl, 20; total acidity, 43; occult blood, 0; stool, 0. She had a mild anorexia. General digestion was good. The abdomen was of normal appearance, not scaphoid. She had a palpable cecum and descending colon. X-ray showed ptosis, spasticity of the colon and indications of a mild right lower quadrant lesion. Dental films showed one infected periapical area.

Urine and Urogenital System.—Urine: sp. gr., 1030; albumin, faint trace; sugar, none; cylindruria, none; leucocytes, few; and red blood cells, none.

Gynecological.—She had normal menstruation, which began at the age of 13. The uterus was retroflexed, and not hypoplastic.

Locomotor System.—She had a mild degree of static back and foot strain.

Nervous System and Sense Organs.—She was in a psychoneurotic state; self-conscious; very sensitive; honte de soi; worried; had mild inde-

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cision. Discontent and envy were well repressed. Even her family did not realize it. There were no signs of organic nervous disease. Eyes and ears were normal.

Metabolism and Endocrine System.—She was 5 ft. 5 in. tall and weighed 114 pounds. She was underweight 24 pounds, emaciated above the pelvis and well nourished below. She had a small thyroid struma, no tremor, no tachycardia, arterial hypotension, accelerated basal metabolism (+ 19 per cent and later + 42 per cent), was hypersensitive to adrenalin, and very sensitive to heat. She had a normal sella turcica, slight hypertrichosis. Normal blood sugar (108 mg.%), and apparently normal pelvic organs with normal function and normal secondary sexual characteristics.

DIAGNOSTIC SUMMARY

(1) Trophoneurosis (lipodystrophia progressiva).
(2) Endocrinopathy.
  (a) Thyreopathy (small nodular struma, slight eye signs, sensitiveness to epinephrin, sensitiveness to heat, accelerated basal metabolism, normal pulse rate, and no tremor).
  (b) Hypertrichosis.
  (c) Arterial hypotension.
(3) Undernutrition (25 lbs.).
(4) Psychoneurotic state (worry, indecision, honte de soi, etc.).
(5) Slight oral sepsis.
(6) Static back and foot strain.
(7) Retroflexed uterus.
(8) Slight hemorrhagic tendency with superficial cuts.

The second case was quite similar to the first, even to the coincidences of the same age at the time of observation and the same interests and occupation, that of dietitian. This patient had just been graduated from college, was intensely earnest in regard to her career, and realized that she herself was a very poor example of dietetic efficiency.

SYNOPSIS OF EXAMINATION

E. L. was 27.

Her chief complaint was that she was thin. She was plump as a child, but became emaciated at 8, following pneumonia.

Her habits were good.

Infections.—She had had pneumonia, empyema (?), and otitis media.

No operations or traumata.

Respiratory System.—She had catarrh and mild hay fever (?). X-ray of the sinuses was clear. She had moderate adenoids and polypoid turbinates. Lungs were clear except for evidence of adhesions at the bases, especially the left.

Circulatory System.—Occasional palpitation; pulse, 84; blood pressure, 102/60; and heart of the pendulous type.

Blood and Hematopoietic System.—R. B. C., 4,128,000; Hb., 71 per cent; W. B. C., 9800; WaR., 0; PMN., 75.2; PME., 3.6; and Sm., 19.6. There was no general enlargement of the lymph nodes and the spleen was not felt.

Digestive System.—Free HCl, 42; total acidity, 74; occult blood, none, and stool negative. She had slight flatulence occasionally, slight constipation and, occasionally, diarrhea. Physical examination was negative. Roentgenoscopic examination showed ptosis and slight spasticity of the colon. Dental examination showed a necrotic root requiring extraction and mild gingivitis.

Urine and Urogenital System.—Urine: sp. gr., 1026 and 1013; albumin, faint trace; sugar, none; cylindruria, none; leucocytes, moderate; red blood cells, none. Pelvic examination showed a retroflexed uterus and prolapsed ovaries, but no evidence of genital hypoplasia. Onset of menstruation was at 13; regular every four weeks; duration 3 to 7 days.

Locomotor System.—She had occasional pain in shoulders, ankles and wrists. Examination was negative.

Nervous System and Sense Organs.—She was in a psychoneurotic state with nervous tension and honte de soi. She was ambitious and her self-control was satisfactory as a rule, but she feared another nervous breakdown like the one seven years previously, which was attributed to hyperthyroidism. She was extremely nervous while under observation. She had no signs of organic nervous disease. Ears were normal. The eyes had normal fundi, but compound myopic astigmatism.

Metabolism and Endocrine System.—Height was 5 ft. 4½ in. and weight 96 pounds, making her underweight 38 pounds. Face and neck were emaciated, thin arms and trunk, well developed legs. She had a small thyroid struma. Pulse rate was normal and there was arterial hypotension. There was no tremor. There was hypersensitiveness to adrenalin. Basal metabolism was 8 per cent above that expected for her age and sex. Blood sugar was 0.108 per cent. Sella turcica was normal.

DIAGNOSTIC SUMMARY

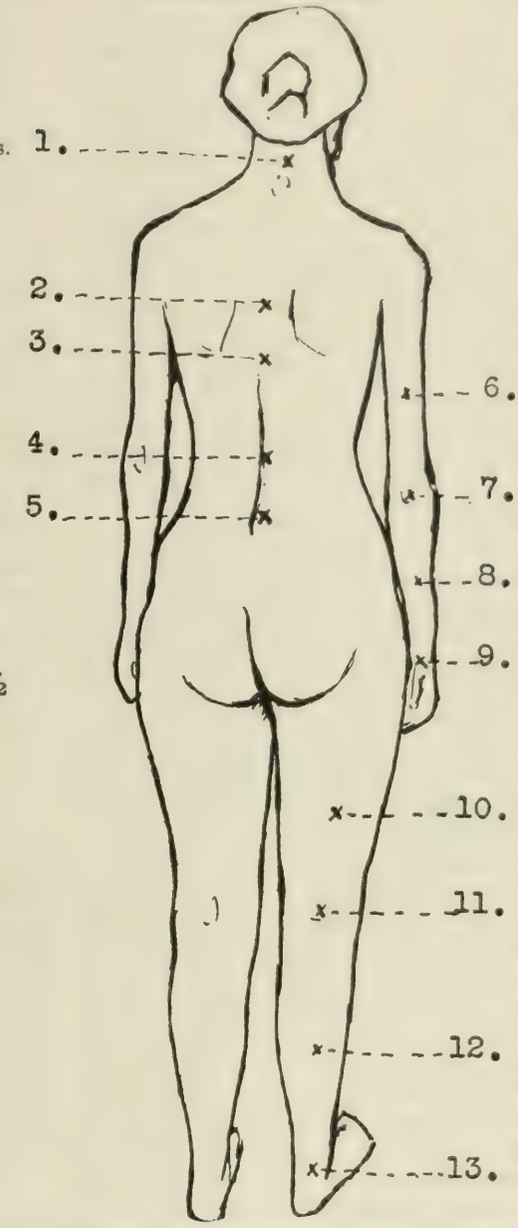
(1) Trophoneurosis (lipodystrophia progressiva).
(2) Endocrinopathy (nodular thyroid struma, hypersensitiveness to adrenalin, high normal basal metabolism, arterial hypotension).
(3) Undernutrition (38 pounds).
(4) Marked psychoneurotic state (worry, overconscientiousness, phobias, self-consciousness, etc.).
(5) Moderate adenoids and polypoid middle turbinates.
(6) Slight secondary anemia (hemoglobin 71 per cent).
(7) Retroposition of uterus.
(8) A refractive error (compound myopic astigmatism).

The second patient, through force of circumstances, could remain only a short time under observation and lacked the support and encouragement at home to enable her to carry out there a sufficiently thorough therapeutic regimen. The other patient, however, was able to take a thorough rest and upbuilding course of treatment in

Fig. 1, Case 1.

COMPARATIVE MEASUREMENTS BEFORE AND AFTER REST AND UPBUILDING TREATMENT

Height 5 ft. 6 in.



	BEFORE Wt. 114 lbs. cm.	AFTER 145 lbs. ½ yr. cm.	AFTER 147 lbs. 2½ yrs. cm.	
1.	30	33	35	1.
2.	78	81	89	2.
3.	68	74	88	3.
4.	62	66	78	4.
5.	84	87	91	5.
6.	19	22	23	6.
7.	19½	21	22	7.
8.	19	20	21¼	8.
9.	14	14	14½	9.
10.	41	46	47	10.
11.	32	36	35	11.
12.	25	28	28	12.
13.	21	22	21	13.

Marginal figures refer to the points on the body where the circumferences were measured. The measurements themselves are expressed in centimeters.

a nursing home and to continue the regimen in a modified form at home. She showed the greatest interest in the therapy and was most cordially cooperative.

One of the generally accepted ideas hitherto held regarding this malady was that the emaciation is progressive to a complete loss of subcutaneous fat in the parts affected, and that once lost in a part the subcutaneous fat never returns; and, further, that attempts to fatten such patients result in an increase in the fat of the lower part of the body alone, thus adding to the patients' deformity.

The chief contribution of the present report is, in my opinion, the demonstration that the factors producing the atrophy do not necessarily remain completely effective, that fat can be deposited again in the parts from which it has disappeared.

The patient was admitted to a nursing home for a short period of observation in May. The slight oral sepsis was treated. She remained at rest in bed and was given a full and varied diet with extra nourishment after meals. General massage was given three times a week and a course of small doses of sodium cacodylate was administered in daily hypodermics. A very help-

ful special nurse was in attendance during the day. The patient made a gain in weight of eleven pounds in eighteen days and was very much encouraged, her best previous efforts having resulted in never more than four pounds. She spent the next four months at her summer home under a modified rest and forced feeding regimen and returned to the nursing home in October closely approximating her calculated ideal weight. She remained under our direct observation for five weeks, most of that time in bed, with the same plan of treatment as before except that the diet was reduced to a quantity sufficient to maintain the ideal weight and exercises were gradually added. We were at that time interested in trying the effect of pituitary extracts in the mobilization and redistribution of fat and she was given the whole gland preparation, 3 grains after each meal, by mouth. She continued taking this preparation for about a year. What part it played in the subsequent changes we do not know.

An examination of the chart of comparative measurements shows that fat was undoubtedly added to the subcutaneous tissue of the upper portion of the body. The most striking and surprising revelation of the chart is shown in the apparent redistribution of the fat during the two years between the second and the third series of measurements, with definite increase in the measurements of the previously emaciated parts with no increase in those of the legs, while the weight remained constant. The measurements were made at as nearly the same places as possible, at a definite distance above or below fixed bony points. The last measurements were sent to us by the patient, who is intelligent and very conscientious. We recognize the possible sources of error, especially in the circumferences of the thorax and of the abdomen. The figures are supported, however, by the patient's statement that, while the face is still strikingly thin, the subcutaneous tissues about the chin are much fuller; that strings of beads and other neck ornaments formerly used are now too small; and that she can no longer wear her rings.

It seems apparent that the face, the part first affected, the part most important to the patient from the cosmetic standpoint, is the most resistant to the renewed deposition of fat. It is evident that we are still a long way from a cure. Two further possible procedures have been suggested to the patient: first, a partial thyroidectomy, in the hope of diminishing the nervous symptoms which persist to a distressing degree, in the hope of reducing the metabolic rate, and with the interest of observing any possible more direct effect of such an operation upon the lipodystrophy; second, a plastic operation, either the subcutaneous injection of fat or a fat transplantation.

Fat injections have been tried in a number of cases with satisfactory immediate cosmetic results, but absorption occurs quickly. Transplantations of fat have been suggested, but so far as we know have never been actually carried out in a patient with this disease.

ETIOLOGY, PATHOGENESIS, AND PATHOLOGY

The etiology of lipodystrophia progressiva is quite obscure.

In general three different hypotheses have been suggested in discussions concerning the pathogenesis of the lipodystrophy.

(1) A disease of the nervous system, a trophic change, or a trophoneurosis.

(2) An endocrine disturbance.

(3) A disease of the fat tissue itself.

Proponents of the hypothesis of a neurogenic mechanism cite in its favor the symmetry of the lesions, the analogy of other fat disturbances in cerebral lesions which do not involve the hypophysis or the epiphysis, the reported change in the subcutaneous fat in the distribution of a diseased sciatic nerve, and the similarly reported alterations in the mammary fat on the affected side in certain cases of poliomyelitis.

In the domain of the endocrine system, consideration has been given to the possible influence of the gonads, of the hypophysis, of the thyroid and of the pineal body. All authors eliminate the gonads, a few consider the hypophysis seriously, quite a number have found evidence of thyroid disorders, and Prof. Klien, of Liepzig, suggested an hypothesis on the supposition of an abnormal involution of the pineal body.

As far as is known, the lipodystrophy has no effect upon the duration of life and the few reported deaths in such cases have resulted from intercurrent diseases. Only three autopsies have been reported and unfortunately all three have been disappointingly incomplete and inconclusive. No significant lesion was discovered in the nervous system or in the endocrine system. Fat was present in the orbits, in the pericardium and in the usual situations in the abdomen and retroperitoneal tissues. Clinical studies showed no increase in the lipase of the blood, no lipemia, and no abnormality in the digestion of fat as determined by examination of the stool after a heavy fat meal.

Certainly, signs of endocrine disturbance have been frequent, though in some

cases they have been entirely absent in the opinion of the reporting observers. An analysis of cases showing endocrine defect reveals a variety of pictures, in such variety and in such contrast that an etiological relationship seems most unlikely.

One autopsy revealed infantilism of the genitalia in a boy of 16 or 17 years of age, slight colloid change of the thyroid and persistence of the thymus. Another autopsy showed almost complete disappearance of the thymus in a twelve-year-old girl. One case was associated with precocious development of the genitalia and of the secondary sexual characteristics. In the great majority of the cases the gonads structurally and functionally were normal. Zalla found in his autopsied case a cyst of the hypophysis, but in Parkes Weber's case the hypophysis was normal. Several of the cases are described as peculiarly sensitive to cold. One of our cases was remarkably sensitive to heat. The basal metabolic rate was found normal by Simons and by Mosse. In Smith's case and in one of ours it was definitely accelerated. It is fair to say that in a number of the cases, including our own, in which the thyroid was diseased, the patients came from districts where goiter was endemic. A moderate degree of hypertrichosis has been frequently reported. The adrenals, when observed at autopsy, have been normal in gross and microscopic appearance. In one case the cortex was rich, in another poor in lipoids. Many cases have been associated with fatigability and a tendency to low blood pressure. Smith's patient had a marked arterial hypertension.

Associated trophic lesions have been most unusual. In one case a trophic change of the skin is described, in another a lesion of a finger nail. Excessive activity of the sebaceous glands was noted in one case and of the sweat glands in a few cases.

One can draw no definite conclusions as to the etiology or pathogenesis of the lipodystrophy from the data available at present. It may be stated that these patients are the victims of a constitutional anomaly, which first appears several years after birth, which may have as exciting cause a trauma, a severe fright or an infectious disease, and which is frequently associated with other constitutional defects, especially in the endocrine system. The nervous symptoms are probably largely functional and are due to the effect of the distressing situation upon a nervous system, which may also have had a share in the constitutional weakness.

NOTE.—I wish to express my appreciation to Mr. O. C. E. Hansen, of the Johns Hopkins Medical School, for his courteous assistance in translation of Italian literature.

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DISCUSSION

Dr. Lewellys F. Barker, Baltimore, Md.—No one seems to know the exact nature of this process. I feel with Dr. Sprunt that these patients represent a constitutional inferiority. They are inferior in the nervous system and inferior in the endocrine systems. This rather suggests that prenatal influences or intrauterine influences may be in some degree responsible.

The localization of the fat disturbance in the upper half of the body does not correspond to half of the embryos by any means. It is not as though one of the two first divisions of the germ cell had been injured, because as we know, one cell does not correspond to the upper or lower half of the body, but rather to the right half and the left half of the body. The fat cells in the upper half of the body do not in this disease do the same kind of work that the fat cells in the lower half of the body do. Why? One may think possibly that they can not build up fat or that they can build up fat and then destroy the fat built faster than is normal.

This takes us into the doctrine of fat formation and of fat destruction in individual cells. The ferment lipase works in a reversible way,

and it is possible that there is some disturbance of the lipolytic function in these cells. If so, it is a disturbance limited to the upper half of the body and does not apply to the lower half of the body. It is hard to conceive of a lipase action which involves only the cells in one-half of the body.

One might think of an influence through the nervous system. Here, too, it is hard to see how the upper half of the body should be involved without the lower half.

We have a group of so-called trophoneuroses. Let me call to mind the hemiatrophy and hemihypertrophy which involves one-half of the body. These conditions appear to depend upon an abnormal action of trophic nerves. One might assume that the trophic nerves innervating the fat tissue in the upper half of the body are involved here. Is there any evidence of central localization of trophic functions? Yes, there is some evidence; and that evidence points to the floor of the third ventricle as the site. Lesions of the tuber cinereum may give rise to dystrophia adiposogenitalis.

It is conceivable, then, that fat metabolism in general may have a central representation in the floor of the third ventricle, and it is further conceivable that half of the area, namely, innervating the upper half of the body, can be disturbed without involving the other half.

Dr. Walter Baumgarten, St. Louis, Mo.—The age at which the disease begins places the onset in two periods of life, that is between the ages of six and twelve, and between twenty and thirty. The onset of the disease in many cases is coincident, at least, with some severe illness, an injury or accident, or a more or less infectious disease. This suggests some profound general disturbance at particularly valuable ages, with especial reference to the younger group.

Secondly, as Dr. Sprunt has pointed out, there has been great confusion in the interpretation of the possible part played in the development of lipodystrophy by endocrine disturbances. Certainly no definite relationship can be ascribed to these.

Lastly, it may be well to cite Parkes Weber's observation that many degrees of abnormal fat distribution occur:

(1) The slight exaggeration of the normal female sex characteristic.

(2) The relative exaggeration of fat in the lower extremities and buttocks of otherwise thin subjects.

(3) The pathologically altered distribution of fat rather than wasting—(for many of these patients are well above the average in weight for their height).

In short, we have no criterion by which this condition can be definitely brought under specific category or classification.

Dr. E. Bates Block, Atlanta, Ga.—I should like to ask whether Dr. Sprunt can give us any information in regard to trophic nerves to fat, whether they are sympathetic nerves, or with what nerves they run. As we know, some trophic nerves run with the sensory and certain other nerves with the motor and the trophic nerves of the intestinal canal are sympathetic.

Dr. Sprunt (closing).—In regard to the trophic nerves, I am afraid I cannot answer the question of Dr. Block. There has been much discussion about that, but all of it seems to be fruitless. There have been pharmacodynamic tests in many cases with varying results. It does not seem that there is any constant sympathicotonia or vagotonia.

CARDIOSPASM, ASSOCIATED WITH ANEURISM, AORTITIS AND ANGINA, WITH REPORT OF TWENTY-THREE CASES*

By J. Russell Verbrycke, Jr., M.D., F.A.C.P.,
Washington, D. C.

A somewhat casual survey of the literature has failed to show that any association has heretofore been noted between cardiospasm and the circulatory disturbances of aortitis, aneurysm and angina. On a recent visit to the Mayo Clinic I asked Dr. Vinson, who has had a vast experience with esophageal cases, whether he had noted any frequency of these conditions occurring concomitantly, and he replied that he had not.

My attention was first called to this subject by several cases in which a great deal of doubt existed as to whether the pain and other symptoms were from circulatory angina or from the well marked cardiospasm which was found to exist.

On reviewing my series of about 250 cases of cardiospasm I have collected 23 who show with the esophageal obstruction some degree of aortic dilatation or angina, or both. This is surely a much larger proportion than one would expect, unless there were some factor common to the etiology of both. I have thought it well, therefore, to bring this before the profession, to analyze the cases, make a few observations and report several in detail.

The patients were about evenly divided between the sexes, there being 11 male and 12 female. The average age was 58,

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Case	Sex	Age	Condition of Cardia	Condition of Aorta	Pain	B. P.
1. M.	F	80	First stage	Fusiform dil. of aorta	None	184
2. R.	M	62	Marked obstruction	Enl. thoracic aorta	None	94-174
3. W.	M	75	Marked obstruction	Aneurysm partly calcified	None	110-176
4. M.	M	77	Moderate obstruction	Negative	Angina	80-150
5. C.	F	67	Marked obstruction. No dil.	Aneurysm	Esophagus	90-130
6. O.	F	48	Marked obstruction. Sl. dil.	Negative	anginoid	...
7. S.	F	40	Marked obstruction. No dil.	Dilatation of arch	Angina	96-110
8. K.	F	50	Slight obstruction	Dilatation of arch	Esophagus	98-170
9. A.	F	48	Moderate obstruction	Marked dilatation of arch	None	92-144
10. V.	M	60	Moderate obstruction. Mkd. dil.	Moderate dilatation of arch	Angina	82-180
11. F.	F	47	Marked obstruction. Mkd. dil.	Moderate enlargement of arch	None	84-158
12. M.	F	47	Mod. obst. No dil.	Marked dilatation of arch	Angina	64-150
13. B.	F	52	Mod. obst. Sl. dil.	Slight broadening of aorta	Anginoid	86-142
14. D.	M	77	Mkd. obst. Mod. dil.	Marked dilatation of arch	None	82-152
15. M.	F	54	Mod. obst. No dil.	Widened below arch	None	92-140
16. C.	M	62	Slight obstruction	Considerable enlargement	None	110-260
17. T.	F	53	Mkd. obst. Sl. dil.	Pulsating enlargement	Anginoid	96-174
18. L.	M	59	Slight obstruction	Slight broadening	None	84-140
19. C.	M	72	Sl. obst. Sl. dil.	Entire aorta broadened	Esophagus	135
20. H.	F	40	Slight obstruction	Slight broadening	None	100-146
21. C.	M	63	Mkd. obst. Mkd. dil.	Marked broadening	None	76-112
22. J.	M	48	Mkd. obst. Sl. dil.	Marked broadening	Angina	100-138
23. F.	M	54	Mod. obst. No dil.	Dilatation descending	Angina	82-112

Totals.—Cases 23. Males 11, females 12. Average age, 58. Youngest 40. O'dest, 80. Cardiac obstruction: slight, 5; moderate, 7; and marked 11. X-ray of aorta, negative 3; varying degrees of broadening to aneurysm, 20. Typical angina, 7. Atypical angina (probable), 4. No chest pain, 10. Digestive pain alone, 2. Blood pressure high, 9; low, 3. Average pressure, diastolic 89, systolic 154.

Abbreviations.—Mkd. (marked); Mod. (moderate); Sl. (slight); Obst. (obstruction); Dil. (dilatation); Neg. (negative); Enl. (enlargment).

with the youngest patient 40 and the oldest 80.

The esophageal obstruction was noted as slight in 5 cases, moderate in 7 and marked with more or less dilatation above the spasm in 11. Twenty cases showed varying degrees of aortic broadening up to actual aneurysm. Three cases with cardiospasm and typical angina gave no abnormal appearance of the aorta.

The fluoroscope with occasional radiograms were necessarily the chief means of determining the actual condition of both the esophagus and aorta. It is very likely that both cardiospasm and aortitis are much more common than we have supposed.

Seven patients had typical angina pain. Four had possible angina but atypical because of its distribution or in that it was not induced by exertion. Ten had no chest pain and 2 had pain only on swallowing. A few had no symptoms referable to the cardiospasm, but the majority were conscious of food or liquid sticking at the cardia, even though there was no unusual pain, and of course many with dilated esophagus had frequent regurgitation.

Circulatory disturbances other than angina which were present in some were dyspnea, palpitation, and irregular hearts, while many showed cardiac enlargement and some valvular lesions. Cardiac enlargement was easily explained by the fact that in the series there were some very high blood pressures, in one instance 260 over 110. The average was, diastolic 89, and systolic 154. In 9 the blood pressure was quite high, while in 3 it was very low.

I have been unable to gain any definite information as to whether the esophageal or circulatory lesions started first or whether they gradually developed together. So also, while I have stated that there must be some common etiology, I must admit that a study of these cases has not brought this factor to light.

Syphilis was proven in only 2 cases. The majority of the Wassermann tests were negative. A few were not made, but there was nothing except the aortitis to indicate the possibility of syphilis being present. And, in this conection, I might state that while some clinicians state that 80 per cent of the cases of aortitis are due to syphilis, my own experience has been the opposite; that is that 80 per cent have a negative Wassermann and no demonstrable proof of luetic infection.

In 11, there was some toxic condition or focal infection present. These consisted of indolic autointoxication, cholecystitis, diseased tonsils, etc. So also 11 showed evidence of increased vagus irritability in some or all of the branches. Colonospasm was frequent.

The diagnosis of these cardiospasm-aortitis cases is easy, for it is made for us by the x-ray, but the determination as to which causes the patients pain or oppression in the chest and the consequent treatment calls for a considerable weighing of evidence and must depend upon the history and clinical examination. Several cases to be presented later will show the difficulties to be encountered.

The treatment for uncomplicated cardiospasm giving symptoms of obstruction is mechanical dilatation. But each of the patients with circulatory complications should be treated individually. The severity of the symptoms caused by the spasm should be weighed against the possible dangers from attempted instrumentation in a case of aneurysm, aortitis, angina or probable high blood pressure. Mechanical dilatation is a rough ordeal for an otherwise normal person and is fraught with possibilities of danger in those whose blood vessels are not normal. It has been shown that the simple passage of the stomach tube may raise blood pressure 40 mm. or more.

I dilated the cardia of but 3 of these 23 patients and it was done without mishap, and with apparent cure of both cardiospasm and angina in one case. On the other hand, 2 of the other patients who were not dilated dropped dead several weeks after the diagnosis was made and instrumentation in these cases might have proven fatal had it been tried.

I shall close by giving a synopsis of several illustrative case histories.

Mr. C. T. J., aged 48, had always been healthy except for attacks of grippe and some acid dyspepsia. Five months previously he had his first attack, suddenly and without apparent cause, of pain in the lower chest, radiating to the back only. A physician told him that it was nervous indigestion and he was finally relieved by drinking hot water. Since that time attacks occurred frequently, coming lately as often as once a day. He was afraid to eat and felt as if there was a lump behind the sternum. Lately, exertion had produced the pain, which was relieved by rest or soda.

Examination showed diseased tonsils. The heart was enlarged moderately to the left. Sounds at the apex were normal. The first aortic sound could not be heard. There was a very short systolic murmur toward the base of the heart. The Wassermann was negative.

Fluoroscopic examination showed decided broadening of the aorta and a 25 per cent increase in heart size. There was marked delay to the passage of liquid at the cardia and some dilatation of the esophagus. Diagnosis was made of cardiospasm, aortitis, chronic tonsil infection and probable angina. He was referred to a heart specialist, who stated that he thought the symptoms were due to the esophagus rather than the heart and he advised stretching the cardia. At this time, however, he began having attacks of pain at night and it was found that amyl nitrite gave instant relief. I decided definitely that he had angina, refused dilatation and again referred him to the heart specialist, who then concurred in the diagnosis.

Mr. A. O. V., aged 60, had symptoms of six months' duration. His trouble had been diagnosed as angina. Pain was in the cardiac region, radiating to the right chest, and was relieved by soda or belching. He coughed up a good deal of thick mucus which was manifestly esophageal. There was no effect of food or exercise.

Examination showed that his heart was negative except for a soft systolic murmur. Pulse was 52 and blood pressure 180 over 82. All laboratory tests, including Wassermann, were negative.

X-ray showed a moderate amount of dilatation of the aortic arch and a moderate degree of cardiospasm with dilatation of the lower third of the esophagus.

Diagnosis was made of cardiospasm, arterial hypertension and angina. Dilatation of the cardia was advised in this case, but refused.

Mrs. M. M., aged 47, had felt food stick at the cardia occasionally for some years, but for the preceding two years had been gradually and progressively worse. Food stuck behind the cardia. Severe pain, taking away the breath, followed eating or walking. Everything hurt except hot water and she was afraid to eat. Hot water the first thing in the morning caused regurgitation of froth.

On examination there was slight enlargement of the heart with a double murmur over the sternum. Blood pressure was 150 over 64. The Wassermann was positive.

X-rays revealed considerable enlargement of the aortic arch and moderate cardiospasm without dilatation.

Her symptoms were undoubtedly more digestive than circulatory. She was sent to the hospital for rest and anti-syphilitic treatment and while there suddenly died with an attack of angina several weeks later.

These histories will serve to illustrate the type of case which we have been considering. A table of all the cases in the series is appended.

The Rochambeau.

Discussion follows paper of Dr. Friedenwald, page 346.

SPASM AT THE CARDIA AND CARDIOSPASM*†

By Julius Friedenwald, M.D.,
Professor of Gastro-Enterology,
and
Theodore H. Morrison, M.D.,
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Baltimore, Md.

Spasm at the cardia and cardiospasm are terms which have been used more or less synonymously to denote a spastic affection of the lower area of the esophagus. Much confusion still exists in the literature regarding the nomenclature of these affections, and only recently Smithies has again called attention to the fact that the two conditions must be distinguished from each other. In spasm at the cardia a temporary contraction occurs which is transient in character; whereas in cardiospasm, in addition to hypertrophy or an unusually strong and prolonged contraction of the cardia, a diffuse dilatation of the esophagus is also present. Most observers consider spasm at the cardia as an acute stage always preceding the chronic lesion of cardiospasm. We have studied our cases according to this classification, as we are entirely in accord with these views. The incidence of this affection is apparently on the increase, but in all probability the explanation lies in the fact that with the development of our more accurate diagnostic procedures, especially esophagoscopy and fluoroscopy, hitherto unsuspected cases are being recognized.

ETIOLOGY

The fact that there are so many theories regarding the etiology of this condition is proof that our knowledge as to its causation is still obscure. A few factors that have been advanced by various authorities may be noted as follows: Rosenstein considers the primary condition to be an atony of the musculature of the esophagus with secondary spasm of the cardia. Kraus believes that the condition is due to the simultaneous development of a prolonged spasm at the cardia and a paralysis of the circular muscles of the gullet brought about by degenerative changes in the vagi. Some observers such as Fleiner, Zenker, and Sievers maintain that a congenital predisposition is responsible for the dilatation. Martin considers a primary esophagitis to be an important factor; and such conditions as congenital or acquired asthenia, organic lesions of the stomach and esophagus such as ulcer or cancer, and kinking of the esophagus at the cardia are among other explanations offered.

Mikulicz, Meltzer and Plummer believe that in addition to changes occurring at the cardiac sphincter, there exists some disturbance of the neuro-muscular mechanism of the esophagus which may permit diffuse dilatation irrespective of actual stenosis due to hypertrophy of the cardiac sphincter. Plummer calls attention to the fact that some individuals exhibit a habit spasm at the cardia without any dilatation of the esophagus. Smithies believes that there always exists a definite hypertrophy of the muscular cardiac ring with demonstrable generalized dilatation of the esophagus of varying degree in cases of cardiospasm. Aaron's explanation of this condition seems very plausible. According to this observer, under normal conditions the cardiac sphincter contracts and relaxes, due to the action of stimuli carried respectively through the vagus and sympathetic nerves. Only the initial act of swallowing is voluntary, while the balance of deglutition is a complicated reflex act in which the peristaltic wave follows the bolus of food, the gullet contracting above and relaxing below the food. During each act of swallowing, inhibitory impulses pass from the sympathetic to the cardia, causing the latter to relax and receive the bolus of food. In cardiospasm this inhibitory control is apparently absent, so that the cardia remains in a state of continuous contraction producing a muscular hypertrophy by overwork at the cardia, and later on a diffuse dilatation of the esophagus. This disturbance in the normal mechanism may be of central, reflex or intra-esophageal origin. Thus shock,

*From the Gastro-Enterological Clinic of the Department of Medicine of the University of Maryland.

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worry and trauma with the hurried gulping of food may be mentioned among the contributing factors concerned in the production of this affection. It is also interesting to note that spasm at the cardia is not uncommonly produced reflexly, by disease of organs elsewhere: as by infections of the gall bladder or appendix; lesions of the stomach, duodenum, and esophagus, or abdominal adhesions, and on the other hand it may be accompanied by spasms of other portions of the body (pylorospasm). Notwithstanding the removal of the primary affection, however, the spasm may persist and may finally lead to a true cardiospasm. Attention must also be directed to a rather small group of cases of spasm at the cardia first noted by Plummer and more recently again by Vinson in which in addition to the dysphagia, a secondary anemia with enlargement of the spleen develops which disappears when deglutition again becomes normal. At first, the esophageal muscles undergo hypertrophy on account of the increased amount of work necessary to overcome the resistance at the cardia; later the esophageal musculature fails against the increasing obstruction at the cardia, and atony and dilatation result. The accumulation and stagnation of food in the gullet further increase the intra-esophageal pressure thus further advancing the dilatation. Meltzer was among the first to consider the dilatation to be a stagnation ectasia, due to an abnormally contracted cardia which he in turn attributed to a disturbance of the nervous mechanism controlling the cardia.

We have had under our care for the past seven years 133 cases of this affection, of which forty-one were instances of true cardiospasm with associated dilatation and ninety-two were examples of spasm at the cardia.

Before considering the symptomotology of this disorder the following etiological factors may be briefly discussed.

Sex.—Smithies and Plummer observe no difference as to its occurrence in the two sexes; whereas Verbrycke finds 61 females and 39 males affected in his series. Our experience would indicate that sex plays only a minor role and although spasm of the cardia occurs more frequently in females, cardiospasm is as prevalent in males as in females, since all cases of the former do not develop dilatation. Of our ninety-two cases of spasm of the cardia sixty-eight females were affected to twenty-four males, while of the forty-one cases of cardiospasm twenty-three were males and eighteen females.

Age.—Spasm of the cardia occurs most commonly in young adult life between the age of eighteen and thirty years. Cardiospasm is more frequent in mid-adult life between the age of twenty-five and fifty years. Cases have been recorded varying in age from four to eighty-three years. The following table presents our cases of spasm at the cardia and cardiospasm arranged according to age:

Ages in Years	Cases of Spasm at the Cardia No. of Cases	Cardiospasm No. of Cases
18 to 30	32	3
30 to 40	21	9
40 to 50	14	16
50 to 60	13	8
60 to 70	8	3
70 to 80	4	2
	92	41

Occupation.—Those individuals who lead an active life physically and mentally are apparently more prone, according to our experience, to develop cardiospasm, while spasm at the cardia is more commonly observed in neurotic individuals.

SYMPTOMATOLOGY

Plummer describes three stages to this disease: first, spasm at the cardia in which the esophageal muscle is able to overcome the resistance at the cardia; second stage, in which a relative or actual increase in the spasm occurs so that the peristaltic action of the esophagus is not sufficient to force food through the cardia; and finally, the third stage characterized by the formation of true cardiospasm with diffuse dilatation. These stages necessarily overlap, and the symptoms manifested depend upon the stage of the disease at hand. Spasm of the cardia, which may be considered the acute form, comes on suddenly following an emotional upset or after the hurried gulping of food and

at times even without any attributable cause. The attack is accompanied by a choking sensation, discomfort and burning in the substernal region and at times by dysphagia. This condition may last a few hours or days and periods of well being may alternate with exacerbations of the spasm. After a variable period of time, the spasm becomes more chronic, food is forced through the cardia with great difficulty into the stomach so that regurgitation becomes a prominent symptom and dysphagia is more marked. In many of our cases the regurgitation was of the explosive type and consequently most embarrassing at times. Some of our patients complained that food lodged in the chest, and only by repeated swallowing efforts or by the drinking of water could be propelled into the stomach. After a variable period of time dilatation develops when considerable quantities of food may be retained. In one of our cases the esophageal capacity was 2,000 c. c. The dysphagia which becomes more and more annoying is not always painful. Some patients complain of dyspnea, cough, crowding of the heart, palpitation and angina-like pains. It is of importance to note that liquids are more prone to produce immediate distress than are solids, although some patients have as much difficulty in swallowing solids as with liquids. The regurgitation in this stage occurs either immediately after the ingestion of food or may be delayed for some hours. The liquid portion of a meal may seep through the cardia, and the solid food with mucus may be regurgitated or remain in the esophagus at times even for days. The regurgitated material does not contain any free hydrochloric acid, is alkaline in reaction, frothy, and contains much mucus. Nocturnal emesis may occur which may prevent proper rest. Other symptoms noted in our cases were loss of weight due to the malnutrition, anorexia, constipation, eructations, headaches, dizziness, nausea, weakness, etc. The duration of all symptoms in our series varied from a few months to 22 years.

DIAGNOSIS

The diagnosis of spasm at the cardia is readily arrived at by noting the appearance of varying degrees of dysphagia, discomfort beneath the sternum, and a choking sensation present in a neurotic individual. In some instances a definite resistance may be encountered at the cardia on passing a stomach tube or a bougie, the resistance being less perceptible to a large caliber bougie than a small one. This sign is more marked in the second stage of the disease. The periodicity in the occurrence of the attacks and the appearance of regurgitation are also suggestive symptoms. A fluoroscopic examination will also aid much in clearing up the diagnosis as a momentary arrest of bismuth will be noted at the cardia. When dilatation occurs the diagnosis is based on the following findings: first, on the clinical history of the preceding stages; second, attacks of regurgitation (sometimes projectile in type) of stagnant food remains containing mucus; third, dysphagia; and fourth, the absence of the second deglutition sound. If a stomach tube is passed into the esophagus, food remains will usually be regurgitated through and around the tube. If the bougie or tube is unguided, it may impinge upon the pendulous esophageal sac in its lowest part; and if the bougie is passed over a thread as a guide, a resistance is experienced at the cardia.

By means of the fluoroscope the opaque meal may be observed at first to be arrested at the cardia, then a trifle will be noted trickling through and finally the esophagus will slowly fill, revealing a uniform dilatation, the outline of which is smooth and regular. In one of our cases so little bismuth had passed the cardia that on account of the huge dilatation of the esophagus, we were at first of the opinion that we were dealing with a congenital anomaly, that is of a stomach transposed above the diaphragm. It was only after taking a series of plates for 72 hours, at regular intervals, that we were enabled to demonstrate that the stomach was in normal position but was small and contracted. In well advanced cases of dilatation the bismuth passes into the stomach very slowly and may remain in the esophagus as long as 24 hours or longer. All of our cases were studied in the lateral as well as the anterior-posterior position

and radiographic plates were made to verify the fluoroscopic findings.

Einhorn has devised a delineator string that casts a definite shadow on the fluoroscopic screen or on the plates, which may be of considerable value in the diagnosis of cardiospasm. The apparatus consists of very fine copper wire (60 in a single strand) covered with braided silk, a metal ball being attached to one end of the string. The strand of wire offers no resistance to spastic movement of the esophagus. Under the x-ray, the shadow of the string appears more or less tortuous, according to the degree of the spasticity. Alterations in the outline of the esophagus from time to time can be easily recognized by means of the x-ray in cases of cardiospasm. After the delineator has been introduced, it may be allowed to remain, which avoids the necessity of the repeated ingestion of barium in the x-ray study of this affection.

DIFFERENTIAL DIAGNOSIS

In the differential diagnosis it is only necessary to distinguish cardiospasm from carcinoma. In carcinoma of the esophagus the duration of the symptoms is shorter, and the patients are usually older. Solids produce more discomfort than liquids, small calibered bougies pass more readily than larger ones, and often carcinomatus particles, pus and traces of blood are obtained by means of the bougie. The fluoroscope shows an irregularly dilated esophagus with a tortuous filling defect, and by means of the esophagoscope the ulcerated growth may be visualized and particles of the tumor may be directly obtained for pathological examination. Luetic stricture can usually be ruled out by means of the Wassermann test, which was made as a routine in all of our cases affected with esophageal stricture.

PROGNOSIS

Plummer reports three cases of absolute cures in which he was able to demonstrate that the dilated esophagus had returned to normal size. According to Meyer and Jackson, when dilatation once occurs, irreparable damage is done to the esophagus, which never again returns to a normal state although the patient may be entirely free of symptoms.

Our experience coincides with the latter view in the advanced cases, but in the early and less severe forms complete cures are unquestionably obtained. Smithies' figures are interesting in this respect and our observations are in accord with his. According to this observer, clinical and functional recovery takes place in 70 per cent; improvement in 20 per cent and 10 per cent are not benefited by any form of treatment. Gastrostomy is necessary to prolong life in these latter cases. Smithies states:

> "Even after the restoration of the cardiac sphincteric action, the esophagus may remain much dilated and permit food retention. However, it is surprising how dilatation of the esophagus may persist and yet be unaccompanied by dysphagia, provided the cardiac orifice is patent and the sphincter acts normally."

TREATMENT

In the acute form attention should be especially directed toward the nervous system and the general health of the patient. In selected cases, rest cures, change of scene and the removal of all irritating influences prove most helpful. Large bougies should be introduced into the esophagus and allowed to remain in situ for a few minutes at a time if possible. A bland non-irritating diet is indicated. Bromids, valerian, belladonna, benzyl benzoate, olive oil and hyoscyamus may be administered with a variable degree of success. In order to prevent the occurrence of the more chronic form, that is cardiospasm, we cannot urge too strongly the early diagnosis of spasm at the cardia. Cardiospasm associated with diffuse dilatation is an example of a more or less serious organic lesion which has its inception primarily in a functional spastic condition of the cardia.

The treatment of cardiospasm may be divided into two forms; those cases in which a silk thread becomes necessary as a guide for the passage of the bougie and those in which the cardia can be entered without a guide. In the milder cases, in which dilatation is only moderate and the cardia is on a line with the axis of the esophagus, we have used the Meyer dilator, unguided, with very satisfactory

results. This dilator can easily be improvised by any one and consists of a double rubber bag made of Penrose rubber drainage tubing between which is inserted a silk bag an inch and a quarter in diameter. These three layers extending six inches up from the closed end of an ordinary stomach tube are securely tied at each end with silk threads. To facilitate the passage of the dilator a flexible steel wire may be used as a mandrin and removed when the cardia has been passed. By means of a glass syringe of 150 c. c. capacity, which is connected to the mouth end of the stomach tube, the rubber bag is distended with water, over-stretching being prevented by the limitation of the silk bag. The treatments can be given at first daily, then on alternate days and the interval may be gradually lengthened to a single dilatation a month. Subsequent to a course of dilatation by means of this method, the ordinary esophageal bougies may be utilized with very satisfactory results.

We have been impressed with the ease with which most patients gradually learn to use these instruments themselves in spite of the futile attempt in inserting the apparatus at the initial sitting. The regime regarding diet and medication as outlined in the acute stages is followed as far as possible in the patients affected with cardiospasm.

An illustrative case of our series belonging to this group is as follows:

Miss H. W., age 28, had been troubled periodically with dysphagia, loss of weight, projectile regurgitation, nervousness and constipation for two years. The physical examination was practically negative, and the roentgen-ray revealed a definite spasm at the cardia with diffuse dilatation of a moderate degree. After a six weeks' medical rest cure at the Mercy Hospital during which period dilatations with the Meyer instrument were regularly practiced, she was discharged in splendid physical condition, having gained twenty pounds in weight. Five years later the patient returned to express her gratitude for her splendid cure, not having had any further difficulty. She continues to use the dilator once a month as a factor of safety. An x-ray examination made at the last visit revealed the esophagus to be of much smaller caliber, and bismuth entered the stomach normally.

In more advanced cases with marked dilatation and a pouch-like formation at the lowest part of the esophagus which may be several inches below the level of the cardia, it is impossible to force a bougie through the cardia without a guide. Mixter of Boston, 18 years ago, called attention to the fact that a silk thread will pass through the orifice that water will pass, and Plummer later utilized this method clinically in the treatment of his cases of cardiospasm. Six yards of a braided silk thread is swallowed and after several coils of the intestine have been passed the proximal end can be pulled taut without the possibility of withdrawing the thread. A perforated olive tip of a Plummer dilator is passed over the thread and by traction on the silk, the sound is directed to the sphincter and by moderate force slipped through the cardia. It is extremely dangerous to use great force in esophageal instrumentation without a guide, as perforation of the esophagus may occur. In order to facilitate the passage of the thread, lavage of the esophagus should be thoroughly practiced and belladonna administered for a few days prior to undertaking this procedure. In one of our cases, the cardia was dilated after being visualized through the esophagoscope, after which the olive tips could be properly directed. The size of the olives passed are gradually increased and later on the Meyer dilator can be employed to augment dilatation. Plummer utilizes a rubber dilator similar to Meyer's with the exception that the former is passed over a string as a guide. After the dilator is in situ, dilatation is produced by a hydrostatic pressure of 675 mm. of Hg. Two or three such treatments are given and the patient is discharged with instructions to return if any further dysphagia is noticed.

The metal cardio-dilator as constructed by Einhorn has been found exceedingly useful in his hands. This instrument consists of a metal spiral covered with a rubber tube, having an expanding end, flexible shaft, a pilot wheel and an internal flexible spiral shaft enclosing a transmission wire. The expanding end is covered with a rubber bag. The instrument is pushed through the cardia about one centimeter and the instrument expanded until the patient complains of pain, which denotes that dilatation must cease. This process can be repeated to a greater degree

in a few days and continued until dilatation becomes complete. In impermeable cardiospasm, Einhorn advises retrograde stretching by means of his inflatable cardiodilator several times weekly.

In some aggravated forms of cardiospasm, inanition may be so great that it may become necessary to perform gastrostomy in order to feed the patient while dilatation is being practiced from above. An illustrative case belonging to this group is as follows:

Mr. C. E. B., age 63, had been suffering from indigestion for 22 years consisting of dysphagia, regurgitation of food, nausea, lodging of food in the chest, a sensation as if fluids would wash down food (but instead they induced regurgitation), and marked loss of weight. The x-ray examination revealed a hugely dilated esophagus with almost complete obstruction at the cardia. Before passing the esophagoscope, food taken six days previously was washed out of the esophagus. The esophagoscope passed easily and revealed an enormously dilated esophagus, having a capacity of 2 liters. By no manipulation were we able to induce the passage of a string through the cardia in this case, and as a life-saving measure gastrostomy for feeding purposes was performed. Dilatation through the esophagoscope was carried out weekly. The patient was dismissed after a five weeks' treatment much improved, but still unable to take much nourishment by mouth. After an interval of three months he returned for observation again, having gained twenty additional pounds in weight. He was able to swallow liquids and the gastrostomy opening was still utilized for feeding.

Recently an advance has been made in the treatment of strictures of the esophagus as well as of cardiospasm by means of heat hyperemia, advised by Lee W. Dean. According to this observer, by means of bougies heated to 45° C., the tissue is so softened that the spasm or stricture may be overcome with little difficulty.

CONCLUSIONS

From our study of 133 cases of spasm of the cardia and cardiospasm as well as from the cases recorded by others in literature we believe the following conclusions may safely be drawn:

(1) It is extremely important to differentiate between the two affections, spasm at the cardia and cardiospasm. While the former is purely an acute affection noted in neurotic individuals, the latter is chronic in character associated with more or less organic change about the cardia with a certain degree of dilatation of the esophagus.

(2) A thorough clinical study with fluoroscopic and esophagoscopic examination will usually clear up the diagnosis without difficulty.

(3) While spasm at the cardia can usually be treated successfully by means of the simple methods ordinarily employed in overcoming functional nervous affections, cardiospasm can only be overcome by means of forcible dilatation.

(4) Since spasm at the cardia is purely a functional condition and usually precedes the more serious and organic lesion of cardiospasm, early recognition and eradication of the former will do much prophylactically in diminishing the incidence of cardiospasm.

DISCUSSION

Papers of Dr. J. Russell Verbrycke and Drs. Julius Friedenwald and Theodore H. Morrison.

Dr. Charles G. Lucas, Louisville, Ky.—That our knowledge of cardiospasm and spasm of the cardia is not complete is evidenced by a remark made by Dr. Lawrence, of Memphis, who reported to a general practitioner in his town that he had fluoroscoped the case sent to him and the patient had a cardiospasm. The physician thereupon asked Dr. Lawrence how much digitalis he should give. Many practitioners believe that cardiospasm has something to do with the heart.

I have seen only a few cases of cardiospasm, and have come to the conclusion that there must be something singular about the District of Columbia and Baltimore that Dr. Verbrycke should have seen so many cases of it.

I invariably fluoroscope my cases and never make a diagnosis of cardiospasm unless there is a dilated esophagus. I have never seen a case over fifty, and I have seen them as young as twenty.

I was much interested particularly in the relation of the condition of the aorta. A man came under my observation sixteen years ago, in whose case I had first made a diagnosis of stricture of the esophagus, who afterward was referred to me by Dr. Abell, and was found to have a very marked cardiospasm with a markedly dilated esophagus. The exact capacity of this I was not able to determine, because when he got a large accumulation of barium in the sac he developed the symptoms of which Dr. Verbrycke spoke, dyspnea and pain, and he has refused to have any mechanical dilatation done.

I am in accord with Dr. Chevalier Jackson, who says that globus hystericus is very frequently spasm of the cardia, and I believe a great many cases of potential cardiospasm have been relieved because of the fact that the exciting focus was either in the esophagus or somewhere in the ab-

domen, and after surgery they are relieved of a possible cardiospasm. The possibility of congenital conditions must be borne in mind.

Two years previously I had another case of cardiospasm referred to me by Dr. Abell. The patient was a woman of thirty-two, who first began to have symptome when she was six months old and nursing. At the time I saw her she had been unable to swallow for five days. We put her to bed and gave her tap water continuously for 24 hours by the Murphy drip. She was relieved and able to swallow. A week later we took a second picture and found a relaxation of the spasm and a small amount of barium trickling through. She refused instrumental dilatation.

The influence of acute infectious conditions also must be considered.

A blacksmith, who had severe influenza during the epidemic of that disease, gradually developed difficulty in swallowing, particularly liquids. One of the characteristics of cardiospasm is difficulty in swallowing fluid. The majority of these patients will take a certain amount of semi-solid or solid fluid material, but when they attempt to drink water they have difficulty. This man with a spastic cardia and dilated esophagus could pass a moderate sized tube into the stomach and pass into that a pint and a half of water. This had been necessary three or four times a day for several months before I saw him. He refused to swallow the string, and I passed a Plummer dilator and dilated up to eighteen points, which gave him relief. He wrote me three months later that he had gained thirty pounds in weight.

I frequently see cases of spasms of the cardia. Only last week I saw a marked case, and belladonna, benzyl benzoate, valerian and bromids gave a great deal of relief. It occurs usually in neurotic patients.

Dr. Sidney K. Simon, New Orleans, La.—It is unfortunate in a way to attempt to differentiate so-called spasm of the cardia from cardiospasm. Is it not true that both conditions are caused by the same etiologic factor or factors? Spasm of the cardia, as I understood the essayists, represents a mild degree of obstruction in the lower end of the esophagus temporary in character and based upon a purely neurological factor, whereas cardiospasm is to be looked upon as some definite organic state. I am of the opinion that both conditions are in reality degrees of the same thing, and I believe we will arrive at a more correct interpretation of the factors underlying the condition if we do not try to separate too finely the etiologic causes.

The point Dr. Verbrycke brought out in regard to the distinction between pseudo-angina and true angina is a highly practical one. It is sometimes very difficult to decide whether an angina is real or false. The pain of pseudo-angina may be quite severe and, just as in true angina, may travel from the chest down the left arm.

I believe that the pain of pseudo-angina is often closely associated with a cardiospasm. Likewise, the association of true angina with cardiospasm and dilatation of the lower end of the esophagus was brought out clearly by Dr. Verbrycke. In cases where we find true angina in conjunction with a cardiospasm we should be on the lookout for the missing link, which is frequently an infected gall tract or gall-stones. Focal infections in the gall tract are very prone to cause pathology in the heart muscle and also in the coronary vessels. Similarly, disease of the gall tract may produce a reflex cardiospasm, so that both forms of angina are commonly associated with lesions in the gall tract.

Dr. A. L. Levin, New Orleans, La.—I wish to call attention to a paper published recently, whose author I cannot recall. The author demonstrated in a number of cases that there exist adhesions of the lower end of the esophagus as it passes the liver groove. Relief is obtained by passing a large stomach tube in early cases where there is only spasm, thus breaking loose the adhesions which are formed loosely between the groove in the liver and esophagus. We have observed in a number of cases of spasm of the cardia that the passage of a large stomach tube relieves more quickly than a group of anti-spasmodics, such as belladonna, valerian and other drugs, and we can also say that where we use drugs alone they afford only temporary relief. The patients come back to us several weeks or several months later with the same trouble.

Dr. Alfred L. Gray, Richmond, Va.—I am inclined to think that there is no age limit for true cardiospasm. Dr. Lucas said he had not seen a case past fifty years of age. I recall at least three at this moment that were sixty or more years of age, and the youngest case I have had was a patient fourteen years of age. These have all been true spasms of the cardia and were treated by dilatation.

I want to put in just here a plea for fluoroscopic control of the introduction of the dilator. I had this impressed upon me very forcibly in Richmond. We make it a routine to observe the passage of the dilator. In the case of which I speak the esophagus was irregularly shaped, with very extensive dilatation to the right. The dilator was introduced and pushed the right side of the esophagus downward. If we had not had fluoroscopic control, and greater force had been used, the dilator would have gone through.

How many cases of esophageal diverticulum have Dr. Friedenwald and Dr. Verbrycke seen with the esophageal diverticulum at the extreme lower end of the esophagus? I have a case which apparently is one of diverticulum of the lower end of the esophagus. Within the past two years it has increased to double its size. I wish to know how best to treat it.

Dr. Verbrycke (closing).—I have only two differences with Dr. Friedenwald, the first of which is more or less academic and not practical, namely, the distinction between spasm of the cardia and cardiospasm. I agree with Dr. Simon that I cannot differentiate between the two conditions, and I consider spasm of the cardia as the first stage of cardiospasm. I have more or less proof to bear that out, in that I have seen cases progress from the first stage through two or three stages to the dilatation.

On the other hand, as far as treatment is concerned, it does not make much difference whether it is a first stage or a third stage case. I make it a practice to treat cases more according to symp-

toms than anything else. The first stage of cardiospasm may give more symptoms than some of the third stage cases. I have in mind one third stage case which had a capacity in the sac of a quart and a half, in which the patient had no symptoms whatever during the day. At night fluid would run up into the esophagus and into her mouth and wake her up. There was no sensation of food sticking at the cardia.

Spasm of the cardia and cardiospasm cannot be differentiated on the basis of etiology. For instance, I have seen cases which originated as neuroses from nerve shock. I recall the case of a man who was suddenly taken with cardiospasm in France on hearing bad news from home. He had the first stage of cardiospasm, which rapidly progressed from that time until he came to this country and was found to have a large dilatation. I recall another patient, eighty years of age, who had had cardiospasm intermittently for forty years. He could not get a drop of water into his stomach during an attack. He had a strong musculature of the esophagus, so that he was able to withstand the pressure from within and push the food through one way or the other way without dilatation.

I have had two cases of carcinoma engrafted upon a previous cardiospasm of long duration, and obtained autopsies in both.

There is a great deal said about the persistence of dilatation of the esophagus after clinical cure. Most of these cases do show a dilated esophagus in spite of the fact that the patient may be free from symptoms. I have three patients, however, who have shown complete disappearance of the dilatation, and two others in whom subsequent examination showed a diminution in size of the esophagus by two-thirds.

I differ with Dr. Friedenwald in regard to treatment. My position is half way between that of Dr. Friedenwald and the Mayo Clinic. The latter are much more radical than I would dare to be in the treatment of these cases. They depend upon one sudden divulsion of the esophagus, and I was amazed to see this done under thirty pounds pressure with a water dilator. They have had no deaths. They have had a number of cases of postoperative cramps, and these cramps are rare in our experience. When I dilate I am controlled by the pain sense, which they seem to disregard at the Mayo Clinic. I am afraid to raise the pressure in dilatation of the cardia beyond the point of pain.

Dr. Friedenwald (closing).—While cardiospasm is the result of spasm at the cardia, it is important to distinguish between the two conditions. Spasm at the cardia is a minor acute affection relieved by simple measures, while cardiospasm is a serious chronic, organic disease, only relieved by forcible dilatation. Gradual dilatation is preferred by us, as we believe it to be free of all danger. Our results from this character of treatment have been extremely satisfactory. We have had under our care a case of rupture of the esophagus in a carcinomatous patient, produced in an esophagoscopic examination preceding a radium treatment.

I have seen only one case in which a diverticulum existed at the lower end of the esophagus, but I have seen several in the upper part.

SEPTIC MENINGITIS IN 5 YEAR OLD CHILD*†

By W. A. Mulherin, A.M., M.D.,
and
V. P. Sydenstricker, A.M., M.D.,
Augusta, Ga.

T. A. G., 5 years of age, white, male of average size and weight.

Family History.—Negative.

Past History.—Negative, except several attacks of acute tonsillitis during the previous two years. He had otitis media two years ago, and again nine months ago, both attacks having been associated with tonsillitis.

Present Illness.—On August 20, 1922, this patient was suddenly taken ill with headache, vomiting and high fever. Hyperesthesia and stiffness in neck-muscles followed next day.

Examination.—He entered the Children's Hospital August 25 (six days after the onset) with mind clear, temperature, 102°; pulse, 128; and respiration 30. Physical examination revealed no rigidity except in the neck-muscles. There was a slight hyperesthesia. Kernig's, Babinski, Brudzinski and contra-lateral signs were absent. Pupils reacted normally to light and accommodation. Membranae tympanorum were normal (confirmed by an ear specialist); mouth, filthy; sordes on teeth; tongue heavily coated; and disagreeable odor from mouth. Pharynx showed catarrhal inflammation. Tonsils were soft, red and excavated. Knee-jerks were slightly exaggerated. Heart, lungs, liver, and spleen were negative.

Vomiting ceased and did not recur. Headache troublesome.

Laboratory Findings.—August 25, 1922 (the night of entrance), the urine was negative; leucocyte count, 32,500; hemoglobin, 70%; spinal fluid was obtained under decided pressure; the cell count was 600 per c. mm., with 90% polymorphonuclears; and globulin strongly positive. Direct smear examination showed a very minute gram-positive coccus, occurring in pairs, also in chains of from 3 to 5 pairs. The cocci tended to be oval, or lanceolate, much like the pneumococcus, but not more than one-third as large. No capsule could be demonstrated. It was not intracellular. Throat culture was negative for Klebs-Loeffler bacillus. Blood culture was negative.

August 26.—Practically the same findings were obtained as on the day preceding; leucocyte count was 30,000, chiefly polymorphonuclears. Subsequent laboratory findings showed a gradual decrease in the leucocyte count, and a diminution of cells in the spinal fluid, with a decrease in the globulin reaction.

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*From Department of Medicine, University of Georgia.

†Read in the Section on Pediatrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

September 20.—Leucocyte count was 14,000 and blood culture negative. Spinal fluid showed globulin a slight trace, and a cell count of 16 per c. mm., spinal fluid was swarming with the same organism as was cultured from the first tap. Blood of the patient agglutinated the organisms grown from the spinal fluid.

CHARACTERISTICS OF ORGANISM RECOVERED FROM CEREBROSPINAL FLUID

(1) The organism was recovered on five occasions, at intervals of two to five days.

(2) It was a very minute gram-positive coccus, occurring in pairs, often in chains of three to five pairs each.

(3) In shape it tended to be oval or lanceolate, much like the pneumococcus, but not more than one-third as large. No capsule could be demonstrated.

(4) It was never seen intracellular in the cerebrospinal fluid.

(5) Cultures were made in various media. Growth was secured on blood agar, serum agar, and in meat infusion broth enriched with serum. No growth occurred on plain agar.

(6) The colonies were exceedingly minute, "dust-like", closely resembling the colonies of B. influenzae. After 48 hours on blood agar, a greenish-brown discoloration occurred.

(7) The organism seemed non-toxic, or non-pathogenic for rabbits. One rabbit received four injections, 1 c. c., 3 c. c., 5 c. c., and 5 c. c., of thick suspension of twenty-four hour cultures of the organism without developing any symptoms. The injections were made intravenously at four-day intervals. This rabbit developed no demonstrable agglutinins for the organism.

(8) Another rabbit received three intraspinal injections of the same suspensions of the organism used in the above experiment. The quantities used were 0.1 c. c., 0.5 c. c., and 1 c. c. The injections were made at four-day intervals, and cerebrospinal fluid was withdrawn on each occasion before the injection was made. No symptoms developed aside from slight convulsions immediately following the last injection, when the quantity of suspension was much larger than the amount of cerebrospinal fluid withdrawn. These cleared up in half an hour, and the rabbit is still living and healthy in all respects.

(9) The serum of the patient agglutinated the organism in dilution of 1/40. Pneumococci were not agglutinated by the patient's serum.

CONCLUSIONS

The organism in question seems to fall into the group we call streptococcus viridans. It differs from the ordinary organisms of this group in being much smaller in size, much more difficult to cultivate, and seemingly entirely non-pathogenic for rabbits, even when injected directly into the spinal canal in massive doses.

A culture was sent to Helmholz and Rosenow, at Mayo Clinic, they having recently reported three brilliant cures of encephalitis lethargica, with a horse serum given hypodermically and intravenously. The serum used by them was produced by injecting a horse several times with a streptococcic organism obtained from a case of encephalitis lethargica. The description of their organism resembles in many ways the organism found in this case. The culture sent to them was made on blood agar, but was not a deep-stab culture, and was found to be sterile when it arrived. Our organism was not subcultured frequently enough, and therefore died. In consequence, a deep-stab culture could not be sent. Owing to loss of our strain we were unable to test out agglutination, although the Mayo Clinic was kind enough to send us the serum.

SUBSEQUENT HISTORY

The clinical picture of meningitis gradually, but steadily improved. Rigidity of the neck-muscles entirely disappeared. Nourishment was well taken, general rigidity and hyperesthesia, in a large measure, disappeared. Stupor was deep and continuous. Temperature ranged between 101 and 105°. This condition prevailed until September 13 (twenty-third day of illness), when the temperature steadily rose to 113° F.

The Children's Hospital clinical record for September 13 and 14, taken by competent nurses, reads: "September 13, 5 p. m.: temperature, 105 4/5°; pulse, 126; respiration, 30. 7:30 p. m.: temperature, 107 3/5°; pulse, 144; respiration, 44; pulse-volume good. 10 p. m.: temperature, 110 2/5°; pulse, 190; respiration, 62. 10:40 p. m.: temperature, 110 4/5°; ice cap to head, and cool rectal irrigation given, hot mustard pack, followed by cool sponging. 11:30 p. m.: temperature, 110 4/5°; respiration, 60. 12 midnight: temperature, 112 2/5°; respiration, 58. Hot pack repeated, followed by cool water sponge; ice cap to head; and heat to feet. September 14, 12:30 p. m.: temperature, 113° F.; hot pack repeated 20 minutes, cold water sponging, cool water rectal irrigation. 1:30 a. m.: temperature, 111 1/5°. 2:50 a. m.: temperature, 110 2/5°. 5:15 a. m.: temperature, 110°; pulse, 180; respiration, 82. 6:30 a. m.: temperature, 109 4/5°; pulse, 190; respiration, 40. Patient perspiring, surface of body cool. Cool rectal irrigation given. 9 a. m.: temperature, 96 4/5°; pulse, 103; respiration, 50. 1 p. m.: temperature, 99 2/5°; pulse, 144. 4:50 p. m.: temperature, 103°; pulse, 128; respiration, 40; pulse-volume good; has taken food and water as usual, but patient decidedly shows effect of his high fever."

One of us saw the patient at 11:30 p. m., when the temperature was 110 4/5°, and questioned the accuracy of the thermometer. Upon investigation, however, the thermometer was found to be perfect in every way.

Examination at that time revealed bronchopneumonia in both lower posterior areas of lungs. The cause of the phenomenally high fever may possibly be explained by the onset of bronchopneumonia, with possibility of localized encephalitis in region of red necleus. Inflammation in that area, due to wounds of head and in paresis, has been known to cause excessively high temperatures.

From advent to hospital, under daily spinal tap for ten days, then a tap approximately every second day for ten days, later followed by a tap every third or fourth day, as pressure would

indicate, the rigidity of the neck disappeared and the cerebral symptoms decidedly improved. Broncho-pneumonia, however, steadily progressed, and claimed the child on the forty-first day of his illness (September 29).

It is our belief that this patient would probably have recovered from meningitis had not pneumonia complicated it. Our reasons for thinking so are:

(1) The clinical picture was steadily improving before pneumonia developed; and also the spinal fluid had shown very decided improvement.

(2) The patient's blood agglutinated the offending organism, thereby showing a certain amount of acquired immunity.

(3) Nourishment and water were well taken up to the onset of bronchopneumonia.

It is our hope, in reporting this case, that it will serve to stimulate the application of more painstaking and scientific work in septic meningitis cases. When such attention will have been given, we believe additional knowledge will be forthcoming which will permit us to save the lives of a few more of these patients.

SUMMARY

(1) This was a case of septic meningitis due to organism resembling streptococcus viridans, but differing very much in growth, morphology and toxic properties.

(2) The primary focus of infection probably was the tonsils. The route of infection probably was through the lymphatics, and not hematogenous.

(3) There was excessively high fever (113° F.) when bronchopneumonia became superimposed. Localized encephalitis in area of red neucleus probably contributed to the height of the fever.

(4) The patient's blood agglutinated the offending organism in dilution of one to forty, showing acquired immunity.

(5) More general scientific work and study should be given septic meningitis cases. If such is done, more definite specific knowledge will be obtained, which will help in lowering its excessively high mortality.

DISCUSSION

Dr. W. McKim Marriott, St. Louis, Mo.—During the last few years a number of organisms have been described which have caused a meningitis. Various cocci and certain members of the colon group have been demonstrated as causes of meningitis. The type of work that Drs. Mulherin and Sydenstricker have done is very important from the practical standpoint. In any case of meningitis the organism should be identified, as otherwise proper treatment cannot be carried out. The giving of anti-meningococcus serum to the patient described would, of course, be of no value. This work does suggest, however, a procedure that might be of distinct value in similar cases. It was shown that the organism in the spinal fluid was agglutinated by the patient's own serum. Antibodies had, therefore, been developed in the blood. Such antibodies were not necessarily present in sufficient amount in the spinal fluid. The injection of the patient's own serum intraspinously should be resorted to in such cases as this.

Meningitis due to the streptococcus and staphylococcus is not always fatal. We recently had a child in the hospital with symptoms similar to the one just described, the spinal fluid giving a pure culture of staphylococcus on numerous occasions. The child ran a febrile course for several weeks and then completely recovered.

Dr. A. A. Walker, Birmingham, Ala.—Hearing Dr. Mulherin's report of septic meningitis reminds me of two cases we had in the Hillman Hospital last year. Two negro children, 4 or 5 years old, came in with typical symptoms of meningitis, convulsions, stiff neck and coma. Lumbar puncture was done and quite extensive work was done on the spinal fluid by Dr. Graham, the pathologist of the Hospital. He came to the conclusion that the organisms present belonged to the influenza group, although they were not typical. There was a postmortem done on both of these children, and both had otitis media, but had shown absolutely no symptoms during life. They died so quickly that the otologist had never looked at the ears.

In the last few years, by far the majority of the cases of prevalent meningitis which I have seen have been due to organisms other than the diplococcus intracellularis, and the meningeal infection has been secondary to disease elsewhere in the body.

Dr. Mulherin (closing).—I would like to say that the ears were not suspicious of any involvement. We had an ear specialist examine them and to keep them under observation. The cases reported by Dr. Walker are interesting and very instructive. Like Dr. Marriott, I am of the firm belief that valuable information is to be gained and lives saved by the routine culturing of spinal fluid in cases of meningitis. Dr. Marriott's advice about giving intraspinously the blood serum of the patient, whose blood agglutinates the offending organism found in spinal fluid, I believe to be both a logical and valuable suggestion. It is by just such procedures, I feel quite convinced, we will be able to gradually reduce the excessively high mortality found in septic meningitis cases.

TONSILS IN CHILDHOOD*

By Lawrence T. Royster, M.D.,
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Few subjects have been so extensively considered during recent years, both by the essayist and the surgeon, as tonsils; so much so that it requires a certain degree of assurance to attempt to add anything to an already voluminous literature. As usual, when the attention of the profession, as well as the public, is drawn to a part of the body as a possible source of disease, that particular part becomes intensely popular, and is made the scapegoat for one more guess in diagnosis, thereby often delaying confession of ignorance. Yet with the discovery of focal infections, the tonsil has come in for its just share of blame and reproach.

Viewed from whatever angle we may choose, the tonsils must be regarded as of very great importance in the diagnosis, prevention and cure of a number of diseased conditions. This is true at all ages, but in childhood it is deserving of special consideration at the hands of the pediatrician.

Healthy tonsils vary widely in size. They may be quite small or so large as nearly to meet in the mid-line of the pharynx, though the latter may be questioned as a healthy tonsil, and normally hypertrophies at the time of eruption of the molar teeth. It is discreet and stands out from the pillars, which are never adherent. The surface is smooth, showing the patent mouths of the crypts into which a probe may easily be inserted. Pus cannot be expressed from the crypts, though a thin mucus may be at times. It is distinctly bi-lobed, being divided horizontally near the center, though often somewhat below the center, by a transverse sulcus, through which a probe may be readily passed. The color is the well known pink of the mucous membrane of the healthy mouth.

The diseased tonsil may, like the healthy one, be of any size. But in other respects it presents a sharp contrast. It may be large and "mushy," with a "moth-eaten" appearance, or may be small and fibrous, or again it may be buried so deep between adherent pillars as to be hardly visible. The surface is usually of a glazed appearance and the crypts, though often invisible, on pressure may exude cheesy masses or fluid pus, which breaks through the glazed surface as through a membrane. The sulcus is frequently obliterated by adhesions and the whole surface is apt to be of the angry red color of a subsiding acute inflammation. Adherent pillars are a sign of previous inflammation except in very young infants.

The enlarged tonsil probably is more apt to become infected than the small one, but there is a distinct difference between an enlarged and an infected one. The list of pathologic conditions for which the tonsil is usually supposed to be responsible has increased materially since the theory of focal infections has been promulgated.

Rheumatism.—Under this head may be classed acute, articular rheumatism, or rheumatic fever, which is common in some localities but exceedingly rare in Norfolk, joint pains and growing pains. As yet, no definite organism has been isolated in this class of cases. The frequency with which infected or "chronically inflamed" tonsils are found associated with these conditions has led to the belief, held by many clinicians, that there is a definite causal relation. Kaiser[1] found that in a series of children operated upon in Rochester, 4 per cent suffered from joint or growing pains before operation, and that only 0.7 per cent were so afflicted one year after operation.

Chorea is usually considered a manifestation of rheumatism, and yet in my personal experience it is rarely accompanied by any symptoms which can be classed as rheumatic. However, almost invariably I have found inflamed and infected tonsils.

Endocarditis.—This condition is likewise supposed to be usually of rheumatic origin. It is rare that I see symptoms of rheumatism precede its onset, but almost invariably there is a history of previous attacks of tonsillitis, and it is not at all

*Read in Section on Pediatrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

uncommon for it to develop during the course of acute attacks of the tonsils.

Pyelitis (or rather pyuria) may accompany or follow an infection of any part of the body, but is a noticeably common complication of infections of the nasopharynx. As a rule the pus clears up from the urine in such instances with the subsidence of the original infection. Quite frequently, however, prolonged pyuria which has resisted treatment of all kinds has cleared up promptly after the removal of chronically infected tonsils. This has occurred in several cases of pyuria in older boys under my care.

Fever of undetermined origin is common in the experience of all who deal with children. Such fever is usually not high, but is apt to be long drawn out. Not infrequently we find tonsils which are not acutely inflamed, but, besides a slight inflammatory redness, they present the usual characteristics of former inflammation. The removal of such tonsils is often followed by a prompt disappearance of the fever.

Recurrent Infections of the Naso-Pharynx are often stopped by the removal of tonsils and adenoids, though no promise should be made in these cases, since many of them are due to sinus involvement and are relieved only through treatment of the sinus or other parts of the nasal cavity.

Otitis, Eustachian Catarrh and Deafness.—Not only are these conditions caused by infected tonsils and adenoids, but when they do occur they are often perpetuated by the fact that the cause is not removed. As a rule in the case of ear complication, the adenoids are infected, exuding purulent secretion, but of course the adenoid tissue impinges upon the opening of the eustachian tube and thus obstructs drainage.

General Sepsis.—There is a limited number of instances of general sepsis of a usually low type, though it is occasionally fulminant, in which the source of the infection is apparently the tonsil. I have seen removal of the tonsils in these cases followed by prompt recovery.

Malnutrition.—The role of chronic tonsillitis in the causation of malnutrition is a mooted one. There are some observers who contend that infected tonsils alone may cause malnutrition, through causing the gradual and constant absorption of toxic products. Others, on the other hand, contend that they act only as one element in a group of factors. Such a point is rather difficult to clear up, since we seldom remove tonsils alone for this condition without instituting other measures for its relief, such as regulating the hours, diet, etc. And yet one frequently sees cases in which everything has been done with no apparent result, only to have the child improve promptly when the tonsils are removed. We also see cases of infected tonsils in which there is no evidence of malnutrition. These points are well brought out by Kaiser in his Rochester series.[2]

Mouth Breathing.—This condition is generally caused by hypertrophied tonsils, or more frequently adenoids, and the condition is usually relieved by their removal. We must make no promise of cure, however, since the habit once formed is often difficult to break. Too high a palatine arch, whether the result or the cause, may be present, and it is evident that the removal of adenoids and tonsils will not correct this.

Cervical Adenitis.—This is one of the most important aspects of the whole subject, and merits a more careful and lengthy consideration than the limitations of this paper will permit. That a definite relation exists between the condition of the tonsils and the infection of the cervical glands cannot be doubted. This applies alike to tuberculous adenitis and that due to other organisms. Just what the exact relation is, is not yet settled. Kaiser found 43 per cent of cervical gland involvement before tonsillectomy and 42 per cent involvement one year after operation.[3] He also found 22 per cent of children with enlarged glands after operation, in whom such conditions did not exist before operation.[4]

The relation between tuberculous and non-tuberculous lymphadenitis has not been decided, but the weight of opinion apparently places the incidence of tuberculous at 60 per cent of all neck glands.

The source of infection is a much discussed question. The point of entry is probably the tonsil, and whether the organism is inhaled, ingested or coughed up from a previous lung infection and implanted on the tonsil is immaterial. If we accept the idea of Ghon that practically all tuberculous infection is primarily pulmonary, the last theory is most tenable. In any event, the tonsil furnishes a fertile culture medium for the bacilli when lodged on them from whatever source.

Indications for Operation.—Only a few definite indications can be determined, since so much depends upon the general condition of the child, the previous history, complications and experience and judgment of the diagnostician. A few indications, however, may be cited:

A history of repeated attacks of tonsillitis (I feel that no child should be allowed to have a second attack of frank tonsillitis); continued pyuria in which calculus has been ruled out, and which pelvic lavage fails to cure; repeated coryza; endocarditis; malnutrition, where evidence of other causes is lacking; and cervical adenitis. Certain types of subacute and chronic bronchitis clear up only after tonsillectomy, and it is rare that a diphtheria carrier can be cured in any other way.

There are few, if any, contraindications. Age of the person is not a contraindication. An infected tonsil should be removed regardless of age, since there has never been the slightest evidence advanced that the tonsil has a definite function. Cardiac lesions are not necessarily contraindications. Tonsillectomy has been performed during the course of acute tonsillitis even in the presence of a complicating endocarditis, not only without apparent harm, but even with evident improvement. The same has been recently done in acute scarlet fever.[5]

When infected glands of the neck have become abscessed, it is usually preferable to operate upon them first and remove the tonsils later. It must be remembered that occasionally in the presence of greatly enlarged glands of the neck an abscess follows so closely upon tonsillectomy that it appears to have been precipitated by the operation.

Tonsil clinics have become quite popular during the past few years; conducted in some instances by state or local boards of health or by private agencies. They are no doubt productive of much good, but a note of warning must be sounded in regard to them. As a rule, the cases are "rounded up" in the course of a general inspection by nurses, and rarely have a systematic physical examination prior to operation.

Operation for Removal.—When an operation for the removal of tonsils is considered, a complete physical examination should be made, records kept, and these records compared with those of subsequent examinations to be made at varying periods after removal. Such examination should of course include the nares and adjoining sinuses.

Where enlarged cervical glands are present at the time of operation the tonsils should be examined for evidence of tuberculosis, as also should the glands if they are removed at a future time.

The operation, of course, in childhood should be performed only under general anesthetic and preferably in a hospital. Complete enucleation alone should be considered, and I think the dissecting operation the superior one, since we are sure of getting at the base of the tonsil. The Sluder operation is quicker and often cleaner, but is very apt to leave a good size piece of tonsil at the base of the tongue. Care must be taken to remove this with a snare before the patient leaves the table. All small tabs should be removed also, since they frequently cause future trouble. Undoubtedly many tonsils are removed where definite indications do not exist; however, since no harm is apt to come of their removal, and much trouble may be prevented by their removal, this does not constitute any great misdirection of treatment. I am emphatically no friend of the tonsil, and think that generally speaking every child would be better off without them than with them. When one sees the frequency with which trouble of various kinds ensues upon a tonsil infection, I am sure many of us wish every

tonsil could be removed before it becomes infected.

Treatment by means of fulguration, x-ray and radium has been advocated, but apparently has no advantage over the surgical procedure except in rare instances where it might be dangerous for the patient to have a general anesthetic, or in cases of hemophilia where operation would be dangerous. Holt states that a child should be kept in bed five days following an operation for tonsils, since the loss of weight is thus prevented. This is often advantageous.

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DISCUSSION

Dr. N. C. Womack, Jackson, Miss.—We are liable to neglect the importance of the tonsil in the question of health because it is of such common occurrence for the tonsil to be at fault. We become so used to its sinning that we are liable ourselves to adopt the fiction that "there is too much talk about the tonsils." If the tonsil is at fault, it is at fault and nothing short of removing it will suffice.

Regarding the occurrence of pyelitis, it occurred to me several years ago that cases of chronic pyelitis that would not yield to ordinary means of treatment were cured, many times, especially when the tonsils were bad, by the removal of those tonsils. I am glad to hear Dr. Royster say this, as it is in line with my own experience, and I am sure it is true.

The question of tonsil infection in those cases of children where you have malnutrition or rickets, that do not yield to ordinary dietary methods, having eliminated every source of focal infection other than the tonsils, one should carefully examine for evidence of diseased tonsils. Those tonsils may, on examination, look normal, the anterior and posterior pillars may be drawn up over the tonsil to the extent that one may feel it is a good tonsil. The throat man will tell you it is a good tonsil on casual examination, but I say that, having eliminated every other source of infection, regulated the diet, and employed every means you know of without beneficial result, removal of the tonsil will prove beneficial.

When should one operate? Five years ago we did not want to operate upon a baby. We do not want to do it now and yet we do. I am associated very closely with a nose and throat man. Five years ago we set the limit at five years. Then we dropped to three, and now we will operate at any time if the baby has a focal infection. We see cases of babies of one month old, or under six months, with colds and congested throats; the throat is so red and swollen that one can hardly get in a tongue depressor. These children should have the tonsils out. I believe these are the pre-cardiac cases. When we see a child of ten or twelve months with a definite heart murmur, we know from our experience that it very likely comes from the tonsil. I hope Dr. Royster will give me his opinion regarding this.

He dwelt upon the question of general propaganda or general education work in child welfare and the work done by the boards of health. We believe, in the abstract, that anything that makes for good health is a good thing.

Dr. H. Leslie Moore, Dallas, Tex.—I have some very definite ideas regarding tonsils, and I think we should no more do universal tonsillectomy than we should make appendectomy universal. There is no more reason why a child's tonsils should be removed because the youngster is not thriving than there is for an adult to have the appendix removed because he is in ill health. Definite symptoms in practically every case should guide us aright in determining whether or not tonsils should be removed. I think any child that is not thriving, suffering from anemia or malnutrition, and where every other source of infection has been eliminated and yet it still does not improve, should have the tonsils removed. I see a great many cases of children who were doing poorly, had their tonsils removed and have continued to do poorly. The trouble was not in their tonsils. We are too prone to jump at conclusions that the tonsil is always the seat of the trouble. There is hardly a chronic case that comes to my hands that has not been advised to have, or has had, an operation for tonsils and circumcision. Now, tonsils that are producing heart murmurs, rheumatism or anemia should be removed by all means. We see many cases where failure of improvement has occurred after the tonsils have been removed. I am a little bit slow in advising this operation. We do see cases of chronic pyelitis that are cleared up following tonsillectomy, yet we have seen many cases in which it has not influenced the pyelitis.

Dr. Jerome Meyer, Birmingham, Ala.—As to age, there is no question that a child of eight or nine months who has repeated attacks of tonsillitis with complications such as otitis media and adenitis, and is losing in weight, the throat specialist being willing (and I always invite consultation) should have the tonsils removed.

The question that Dr. Royster brought up about a thorough physical examination before operation is important. We find that many cases will come in an hour before operation without having had the urine examined or a physical examination made. In our clinic we insist that the child be admitted to the hospital a day or two before the operation. The temperature is recorded every four hours, a complete physical, urine, blood and stool examination is made. If there is any elevation of temperature or any indication that makes it advisable for the child to remain in the hospital a few days or weeks, we postpone operation.

Just before leaving Birmingham I asked Miss Clements, who is associated with the Anti-Tuberculosis Association and is doing some nutritional work, to let me have the statistics that were available. These were cases of children who were seen in the North Birmingham schools in the different districts. In one school the number under weight was 73.9 per cent. This was reduced, after adenoids and tonsils were removed and general nutritional work instituted, to 34.7 per cent. In another school the original percentage of 43.7 for the entire class was reduced to 6.2 per cent after adenoids and tonsils were removed.

Dr. John Zahorsky, St. Louis, Mo.—For many years I think I have been at least one of the exponents of conservation in the removal of tonsils in the young child. We pediatrists (I am not saying anything about the nose and throat men) have to keep in mind always one function of young children, that is the unquestionable acquirement of resistance to respiratory infection. You find that the child gradually acquires increased resistance as it grows older. This comes on at seven or eight; some at six or five; and the majority go to eight years. Then they do not have respiratory infections so often for they get that immunity which most adults have. During the young growing period the child has to acquire this resistance and it does this most commonly by repeated attacks of the disease because these diseases do not produce permanent immunity. I believe the tonsil is a very important organ in increasing this resistance. Why? Every respiratory infection has its origin not in the tonsil or in the lymphoid tissue of the upper respiratory tract, but in the mucous membrane. All lymphoid tissue is to absorb foreign products from the organs. Every acute respiratory infection that causes acute infection of the tonsil is not so liable to go into the chest structures. If you have a pneumococcus infection of the upper respiratory tract, there is a simple reaction of the tonsil, and a temporary immunity to this pneumococcus is acquired in the upper respiratory tract. We find in young children who have had the tonsils removed an increased incidence of pneumonia, bronchial infections, and enlarged bronchial glands. Often in the young child when you take out the tonsils Nature goes to work and forms other tonsils. We get a secondary rapid growth of an adenoid tissue in order to replace what you have taken out. The nose and throat specialist does not see the child after he takes out the tonsils. There is an increase in weight. If you have infected glands, you have an increase in weight after they are removed. That is one of the phenomena that comes from the removal of any infected focus. The tonsil becomes infected in every acute respiratory infection of the upper air passages if redness and inflammation mean anything. Of course, an exudate only occurs if there is sufficient infection in the tonsils so that it cannot dispose of the products. When the tonsil throws off this infection there is no indication for removal. If the tonsil is so constructed that it does not throw it out, you have to consider taking out the tonsil. We do not take out an inflamed tonsil immediately any more than we take out an infected lymphatic gland in the neck. It is very rare that an endocarditis comes from a chronically inflamed tonsil.

Dr. W. W. Harper, Selma, Ala.—"If thy hand becomes diseased cut it off; if thy eye offend thee, pluck it out." I do not see the necessity of taking out all tonsils. I am in line with my friend, Dr. Zahorsky. We have a wave of hysteria in this Country. I think that tons and tons of perfectly normal teeth have been pulled for all sorts of things. I sometimes wonder if the dentists are not "in cohoots" with the makers of forceps.

I do not agree with my friend, Dr. Womack. I do not believe there is any more dangerous propaganda than taking out tonsils in very young children, unless they do it better than some of the operators I have seen do it. You take out the tonsils in a two-month-old baby and if you do not have a funeral you will have a long convalescence. Blood wastage is one thing that extremely young babies cannot stand. The question is, is the tonsil diseased? If it is diseased, take it out. I do not mean during an acute inflammatory attack. What are the tonsils put there for? They have a function. The appendix has a function besides furnishing a living for a lot of doctors. The tonsils have a valuable physiologic function. If you are going to take out every tonsil that is affected, why not take off the nose every time your patient has a cold or the lungs every time you have a pneumonia or a bronchitis? As far as rheumatism is concerned, in London they have more rheumatism than anywhere in the world, and rheumatism is almost unknown under one year of age. If the tonsil is diseased take it out, but do not take it out during the first attack of tonsillitis.

Dr. W. McKim Marriott, St. Louis, Mo.—I agree with practically everything Dr. Royster has said about tonsils. There should be no age limit for the removal of tonsils. If a baby has continued attacks of otitis media and has enlarged, inflamed tonsils, they should be removed, no matter what the age of the infant. The good results in preventing further infections of the ears and rhinopharynx are striking.

Children that suffer from repeated attacks of acute bronchitis, or upper respiratory infections, often have diseased tonsils and adenoids. I agree with Dr. Zahorsky that in many of these attacks of bronchitis the infection starts in the mucous membrane of the upper respiratory tract. For this reason the tonsils and adenoids should be removed, as it is here that the infection begins. A diseased tonsil is more likely to be a constant source of infection than the place where immune bodies will be produced. We certainly see many infants in whom the tendency to bronchitis and other upper respiratory infections diminishes when the tonsils and adenoids have been taken out.

Some children who develop nephritis of the type ordinarily known as the acute parenchymatous variety have chronic infections in the nose and throat. Often it is necessary to remove the tonsils and also to clear up infection in the

accessory nasal sinuses in order to cure the nephritis.

Just a word about the method of tonsillectomy. Dr. Royster has mentioned the fact that a general anesthetic is necessary. This I agree with, but that general anesthetic should not be ether. Gas is far preferable. The after effects of ether are bad. The operation must be performed quickly. Sluder's technic meets every indication, and when properly carried out under gas anesthesia the results are excellent, even in extremely young infants. Within a few hours after the operation it is impossible to pick out from the ward the children who have been operated upon and those who have not.

Dr. R. J. Estell, Lexington, Ky.—There is one thing which has not been brought out in the discussion thus far, namely, the failure of removal of tonsils and adenoids to cure mouth-breathing. I have seen many such cases which show a narrowing of the dental arch continue the mouth-breathing until the orthodontist corrects this defect.

Another thing is the possibility of status lymphaticus. I believe in very young children, under two years of age, this should be very carefully ruled out before any tonsil operation is undertaken.

Dr. Philip F. Barbour, Louisville, Ky.—I think the question of tonsils is one in which the pediatrician should take a very lively interest. Very many cases come to me that have already been operated upon for tonsils or adenoids by ear, nose and throat men who have never gone into the real history to see whether such an operation was necessary. I think we should educate our patients to the feeling that the pediatrician should pass judgment on the tonsil before it is removed. I have seen tonsils that stood out in the throat and were very large and the average throat man would say they should be out, and yet the tonsils were not diseased. I have seen tonsils so small that you could scarcely see them and yet they were the seat of very serious infection. I have relied upon two or three things in forming my own judgment as to whether the tonsils should come out. Are the cervical glands swollen or not, and is there infection in the tonsil? If you find a preceding infection in the cervical glands that drain the tonsillar tissue, there is an infection in the tonsil whether the tonsil is large or small and this seems to be a very good indication for taking out the tonsil. If there is pyelitis, nephritis or malnutrition, and you can find no other source of infection, I think you are warranted in taking the tonsils out. I do not urge removal of tonsils in very young children unless the evidence of infection is so great that there is no question in my mind that that is producing a permanent effect upon the child.

I do not think we can take out tonsils with perfect impunity in childhood. I have seen a good many where the operation has left the throat in a perfectly miserable condition from the formation of scar tissue. I would want the child put under a very good anesthetic so that the man could go in and take his time and find the tonsil and see that it is totally removed. Let us not be carried away by the wave of enthusiasm about taking out tonsils. I believe that every tonsil that is diseased is a menace to health, but when it is not diseased it should not be removed.

Dr. Eugene Rosamond, Memphis, Tenn.—I believe that the discussion should be, "What is a diseased tonsil and what is not a diseased tonsil?" Let us take a common sense view. As long as a tonsil does its work and is not diseased, it should be left in. When it is diseased, it should be taken out. Nature put these tonsils in the child's throat to protect the upper respiratory tract from infection. Nature put this lymphoid tissue there through the growing period of the child as an added protection. We might compare the tonsils to charcoal filters placed between the roof and the cistern. So long as they purify, they are useful and should be left in place. When they pollute, they must be removed.

Dr. Arthur G. Jacobs, Memphis, Tenn.—The subject of tonsils is such a wide one with all pediatricians that I feel we ought to discuss it freely. One point that steps into the foreground in regard to the operative treatment of tonsils is this: there is a tendency on the part of nose and throat men to wait until the child is four years old before removing the tonsils. I cannot see just why a child should be permitted to suffer from the ill-effects of diseased tonsils for four long years. During that extended period it may suffer irreparable injury. There is no reason why a two- or three-year-old child cannot take an anesthetic and have its tonsils removed before it is too late to remove them. Many nose and throat men say, "we will wait until they are four years old." By that time it may be too late. There may be some serious cardiac or other trouble developed in that period of time. It has been a source of considerable difficulty with me to get nose and throat men to do this operation and do it now, not in two or three months. We should certainly not wait until the child is four years old before doing that operation. I think that is one important thing that should attract our attention.

Dr. Owen H. Wilson, Nashville, Tenn.—Removal of tonsils is always a prolific subject for discussion. I am not willing to agree with Dr. Royster on all points, but I do not know any more about proving my contention than he does.

I would like his opinion on operations upon the acutely inflamed tonsil. Is there any guide? I usually set the arbitrary limit at 14,000 white count.

Dr. Royster (closing).—Most of the discussions on my paper have agreed, many times unconsciously on the part of the speaker, with everything I said rather than disagreed with me. I emphasized very carefully that the child should have a thorough physical examination. I also emphasized the fact that the tonsils should not be removed without an indication. On the other hand, I did say what my opinion of the indication was. So often we do see endocarditis and other infections come, that we wish the tonsils could have been removed before the infection set in. I do not mean to advocate universal removal of the tonsils. I am not quite in the position of the man who said, "When the cord is tied remove the tonsils." We recall the early operations for appendicitis, and the theory of that day that the appendix should only be removed as a last resort has been superseded entirely by its prompt removal as soon as indications arise. That is true with many other things. Now, I consider that infinitely more harm is done in my personal experience by infected tonsils not only to the child at that time but in future life from endocarditis than was ever done from appendicitis. When we see the crippled child with bad heart we can trace a good portion of it back to the time when that child had tonsillitis in childhood.

I answered the question as to what the indications are. I would not say any indication for the removal of the acutely infected tonsil and yet this has been done successfully, and has cut short the attacks of endocarditis. I do not do a general practice. I only do a referred practice and consequently the cases that come to me have often been to three or four doctors. I have seen a good proportion of tonsils that were at the bottom of the trouble. I never order tonsils removed unless there is an indication and the indication depends upon you and not upon the throat man. Practically all tonsils become infected sooner or later. We do not know the time to operate. I see no contraindication in age. I do think when a child has a frank tonsillitis that we have no right whatever to let that child have a second attack, because that is the time when endocarditis comes. If you people see as many cases of endocarditis in a year as I do, you will agree with me. It seems to be the curse of childhood at the present time.

TROPICAL DISEASES AND PUBLIC HEALTH

THE LIMITATIONS OF LABORATORY EXAMINATIONS*

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The purpose of this paper is to bring before this Section some of the problems which confront the public health laboratory. Its function is a dual one: it must be in a position to provide the health authorities with comparative statistical data from which the efficiency of various epidemiological procedures can be checked, and it must exercise its diagnostic function for the use of the practicing physician, who should, however, use this privilege only for the detection, or rather, aid in detection of acute infectious diseases or other morbid conditions the spread of which can be controlled by preventive measures.

Bearing in mind the usual routine procedures carried out in board of health laboratories, we shall proceed with the discussion of the various problems with which the executive must contend. He must keep before him the fact that the laboratory is a public institution and must be prepared to give prompt and efficient service at all times regardless of any emergency which may arise. This needs no discussion here, as it is purely an internal problem which is overcome by a properly balanced personnel, both office and technical, working under a system of receiving and recording adequate to the particular needs, but elastic enough to cope with emergencies.

The three sources of most of our difficulties are: (1) improper collection of material for examination; (2) failure to give proper data; and (3) failure properly to interpret the results.

The laboratory should not be expected to secure results from material unfit for examination. If the condition of the patient is such that a laboratory examination is deemed necessary, it is certainly worth the effort required to submit a proper specimen with sufficient data. Neither should the laboratory be called upon for the final decision; but the result as received by the physician should be considered only in the light of an additional symptom and checked carefully with the other clinical findings. The laity and, we are sorry to say, in many instances the profession, are prone to regard a laboratory as a place to obtain definite decisions positive or negative. For this reason we have to as large an extent as possible dropped these terms in reporting. A consideration of the various examinations undertaken in board of health laboratories will tend to impress these important facts.

WASSERMANN REACTIONS

Very little of our former difficulties in respect to the manner in which samples are received remain. Certain points, however, are worthy of note. The familiar Keidel tube solves all the difficulties, but its distribution by boards of health is prohibited by its cost. We use a sterile, cork-stoppered test tube in our outfit and send the following directions:

"About 5 c. c. of blood or spinal fluid should be collected in a sterile or dry, chemically clean container. If a syringe is used it should be rinsed in sterile physiological salt solution. Do not use water to rinse syringe or tube."

That these directions are being followed is evidenced by the fact that despite an increase of 33 per cent in the number of tests performed during 1921, we had only 280 unsatisfactory as against 440 during 1920.

In the interpretation of the results we still experience considerable difficulty, and are called upon not infrequently to state definitely whether the patient has or has not syphilis. In public health laboratories where we necessarily do not come in contact with the clinical aspect of the case, it is unjust to expect us to pronounce this sentence. The reaction is not biologically specific, but is dependent upon certain substances found in the blood in syphilis and occasionally in other infections. We can-

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not, therefore, do more than report the actual result of the test to the physician. Nevertheless, the laboratory should give as much information as possible. To this end we have used until October 1 of this year two antigens: a one-half saturated cholesterinized alcoholic extract of beef heart and the acetone insoluble fraction of an alcoholic extract of beef heart.

A comparison of the results of our tests positive in the cholesterinized antigen for the years 1920 and 1921 show the following:

	Cholesterinized Antigen	Acetone Insoluble Antigen
Total positive	7682	
Positive plus 4	4400	2755
Positive plus 3	1494	906
Positive plus 2	947	614
Positive plus 1	841	631
Negative		2776

It will be seen that in 7682 positive with the cholesterinized antigen, 2776 showed negative with the acetone insoluble antigen. This has led to considerable confusion in interpretation. A single result is desirable, but should not be given at the expense of accuracy.

Beginning with October 1, 1922, we have instituted Kolmer's standardized method, a primary ice box fixation using only one antigen. Kolmer's antigen is a specially prepared cholesterolized and lecithinized alcoholic extract of the powdered muscle of several hearts, and in his hands and others has been proven to yield more specific results, being highly antigenic and having very low anticomplementary properties. Our reasons for changing to this method are:

(1) That from the evidence at hand this test has proven to yield less false positives and more accurate results from a specific standpoint.

(2) That in cooperation with the State Board of Health of Alabama we are endeavoring to standardize laboratory technic and methods in all the board of health laboratories in the State.

THE DIAGNOSIS OF TYPHOID, PARA-TYPHOID FEVERS AND DYSENTERY

With the wide use of typhoid and paratyphoid vaccine the positive value of the Widal reaction has been greatly reduced, as it is certain that in a great many instances agglutinable substances are formed in reaction to it. The usual method of submitting blood for this test is to allow several drops to dry on a slide. In the laboratory, to obtain dilutions, physiological salt solution is added, but not knowing the original volume of the blood the dilutions used are only approximate. Performed in this manner just what can the laboratory conclude? Very little, as we are hampered by an ignorance of the clinical aspect of the case. By far the better method of submitting samples for a Widal reaction is to obtain in the same manner and a like quantity as for a Wassermann test. With sufficient serum at our disposal we can make accurate serial dilutions and titrate the amount of agglutinable substances present. It is reasonable to suppose, in an actual infection with either the typhoid bacillus or one of the para organisms, that the agglutinins will show a much higher titre than following vaccination. In fact, Straus has found that the titre following vaccination rarely exceeds 1-50, and false agglutination is eliminated at 1-100. It must be remembered, however, that it is possible for a person to have a typhoid infection without being able to demonstrate agglutinins in the blood at any time. The Widal reaction is not a test for typhoid fever, but is used to determine the presence or absence of typhoid agglutinins from which certain conclusions can be drawn.

Bearing these facts in mind, it is readily seen that the laboratory, by limiting its work on typhoid to the Widal reaction, is not doing its full duty. Cultures of the blood, urine, and feces should be instituted. To introduce blood cultures in typhoid diagnosis as a routine procedure would necessitate the authority of selection of cases by the laboratory director, as the immense amount of technical work required could not be applied indiscriminately. A suitable container for general use consists of a small cork-stoppered bottle containing sterile bile, to which is added about one-half its volume of blood. The inhibiting action of bile on certain organisms, with the fact that it is a favorable medium for the growth of typhoid bacilli, makes this method practical. The chances of obtaining positive blood cultures diminish rapidly after the seventh day, and this fact should be borne in mind in interpretation of results. Urine and feces cultures

should be taken not only as an aid to diagnosis, but to determine the carrier state. These may be taken in 30 per cent glycerin. Comparative tests have shown that fresh feces do not yield as high a percentage of positives as glycerinated specimens (Straus).

For the diagnosis of dysentery, feces cultures are necessary, but the laboratory should insist on specimens of blood to be examined for agglutinins. Especially is this true in field work on outbreaks of diarrhea, when laboratory facilities are poor.

TYPHUS FEVER

Occasional sporadic cases of this disease occur in this country. It is therefore well to bear in mind that the laboratory can aid in diagnosis of suspicious cases by performing a Weil-Felix reaction. This is a macroscopic agglutination test carried out with proteus bacilli and the patient's serum. The same quantity of blood as is used for the Wassermann reaction is necessary.

THE DIAGNOSIS OF MALARIA

The examination of films for malarial plasmodia requires a satisfactory specimen. It should be taken before the administration of quinin and the time before or after the chill should be stated. Probably more unsatisfactory specimens for malarial examination reach us than any other variety, yet it is a comparatively simple matter to place a drop or two of blood at the end of a slide and with the edge of another make a thin, even film which is easily stained and gives us a proper field in which we can study not only the character and proportion of erythrocytes and leucocytes, but also discover the presence or absence of plasmodia malaria. The failure to demonstrate plasmodia does not mean that the patient is not suffering from the disease. This is one of the tests which has a positive value, but very little negative value.

SPINAL FLUID

In general, what applies to the Wassermann reaction in blood work applies here. All cases of syphilis involving the central nervous system do not give a blood Wassermann. They may only show a reaction in the spinal fluid which explains the importance of spinal fluid Wassermann tests.

Cell counting is a very valuable procedure, but it must be remembered that unless they are counted within a very short time after withdrawal, autolysis occurs, and also that a cell count on spinal fluid contaminated with blood is without value.

Results on tests for globulin must be interpreted by the clinician.

The colloidal gold reaction is a physiochemical reaction which not only will show that a pathological condition exists, but will also indicate to some extent its nature, as specific discolorations are produced in certain diseases. As yet this test has not been adopted generally as a routine public health procedure.

Cultures and direct bacterioscopic examinations for the detection of organisms causing meningitis are of great value both from a clinical and public health viewpoint, particularly in the diagnosis of meningitis caused by the diplococcus intracellularis meningitidis; from a clinical standpoint because specific serum can be administered, and from a public health standpoint because the disease being of carrier nature can be readily controlled. Further, the bacterioscopic and cultural examinations of all cases of meningitis will lead to a definite diagnosis, and if the health authorities are not involved, at least their laboratory has proven that further investigation on their part is not necessary.

TUBERCLE BACILLI

The proper collection of samples should certainly not be difficult, but after a number of years' laboratory experience we are forced to state that, considering the serious nature of tuberculosis, physicians, nurses and laymen alike do not seem fully to appreciate the dangers in handling tuberculous sputum. It is really amazing to see in how many weird manners sputum can be submitted to the laboratory for diagnosis. We have gotten it in handkerchiefs, in envelopes, on scraps of paper, in milk bottles, in coca-cola bottles, vaseline bottles, ointment jars, opened or closed, partially filled, leaking, filled to overflowing and so on *ad infinitum*.

We would urge a more careful handling, not only from our own standpoint, but also for the protection of the physician and his other patients. When the least is said, and leaving out the danger of actual con-

tact with known tuberculous sputum, it is decidedly unpleasant to have to come in contact with sputum of any kind.

The bacterioscopic examination of sputum is another test which has only a positive value, as our failure to find tubercle bacilli does not mean that the patient is not tuberculous. The method we use is one not generally in use, but we feel it is entirely practical from all standpoints. We provide a small, wide-mouthed, cork-stoppered bottle, containing a few cubic centimeters of 5 per cent phenol. When these are returned with the sputum, we autoclave them, thus sterilizing the contents, and at the same time breaking up the mucus. We then centrifuge the specimen, which concentrates the bacilli in the bottom of the tube, from which we then make our smears and stain in the usual manner.

GONOCOCCI

In obtaining a specimen from an acute case of specific urethritis in the male there is scarcely anything to be said, but in examining the smears from the female genitalia we have an entirely different problem to face. A vaginal smear for diagnosis is practically worthless with the possible exception of the not infrequent cases of specific vaginitis occurring in infancy and early childhood. As a proof of this statement, we might offer the following figures from our annual reports of 1919-20-21. Of 8417 venereal smears examined, only 941 showed the presence of an intracellular diplococcus similar in morphology to the gonococcus.

These figures include not only those specimens submitted by the physicians, but those taken in our venereal isolation hospital for women, and those taken by myself from girls remanded to the Health Department by the Recorder. In taking these smears we exercise a great deal of care. We place the patient in the lithotomy position, cleanse the external parts before introducing the sterile swab into the urethra, and cleanse the vagina before obtaining the cervical smears.

This test, therefore, has only a positive value, and in as much as in the bacterioscopic examinations we depend only on the morphological and staining characteristics of the gonococcus, our reports are worded, gram-negative intracellular diplococci found or not found, as the case may be.

The technic of cultural isolation of the gonococcus is such that it is impracticable to introduce it as a routine measure in public health laboratories.

The affinity of the gonococcus for the conjunctiva makes it imperative to examine very carefully all cases of suppurative conjunctivitis.

DIPHTHERIA

A public health laboratory plays a rather important role in this disease. Not only are we called upon to make diagnoses of actual cases, but also to determine the presence of carriers among contacts of known cases that steps may be taken to prevent widespread epidemics. The direct bacterioscopic examination of smears from suspected throats is subject to so great an error that it is hardly worth while doing it. Only about 25 per cent of direct examinations on known cases show the presence of the organism. Our routine is to supply the physician with an outfit consisting of a tube of Loeffler's blood culture medium, a wooden tongue depressor, an envelope containing two sterile swab sticks and a data blank.

The use of this outfit is to be desired, as many hours may be saved in diagnosis if they are properly used. The media should be fresh, its surface should be free from growth, and it must not be too dry. All of these warnings are stated on our data blanks, and yet we receive far too great a number of cultures on improper culture media. It must be remembered that while it is permissable for the laboratory to state that a culture is either positive or negative, this report must not be taken to mean that the patient has or has not diphtheria.

Tests for the virulency of diphtheria bacilli are of great value in releasing from quarantine chronic carriers whose throats and nasopharynges persistently show positive cultures despite vigorous treatment, including at times tonsillectomy.

RABIES

This disease, if contracted, is, as far as we know, in human beings always fatal. In view of this fact the diagnosis of animal heads submitted for examination assumes tremendous importance, especially

in our State, where the incidence of rabies is high among animals. For instance, during the years of 1919-20-21 there were 338 animal heads submitted, of which 112 showed the presence of Negri bodies. Of the remaining, 202 showed no evidence and 24 were received in such condition that examination was impossible. Considering that these figures are for Jefferson County alone, it can readily be seen that this is an important problem.

We feel that we have more difficulty in handling this question satisfactorily than in any of our other procedures, so much superstition surrounds this subject not only in the minds of the laity but among the profession. The status of diagnosis is this: that if Negri bodies are found in fresh brains the animal is rabid. If suspicious bodies are found in fresh brains it must be considered rabid, and if suspicious bodies are found in partly decomposed brains it should be considered rabid. This seems easy enough and it certainly settles the question from a positive standpoint.

Unfortunately the usual thing done in cases where people are bitten by animals is to kill the animal immediately and submit its head for diagnosis. Our opinion is that the examination of the brain in such cases is a useless waste of time, but here we face this difficulty: that an animal showing definite symptoms of rabies and killed immediately will usually show Negri bodies. We realize also that at times it is not possible to catch an animal and pen it up. Nevertheless, in going over the history of animals whose heads have been submitted for examination we find that a large number are killed which show absolutely no symptoms of rabies. What are we going to tell the patients when our examination fails to reveal any evidence of rabies? Just this: that if the animal died it was probably not rabid, but if it was killed we cannot give any opinion whatever or any advice as to whether the patient needs the Pasteur treatment or not.

For a period of about eighteen months we inoculated rabbits subdurally from all brains showing no evidence of rabies. Out of the total number of rabbits several died with typical rabies and the brains showed Negri bodies. While this is interesting from a scientific standpoint, it is not a practical procedure when you think of the patient. The rabbit does not succumb from an infection with street virus for about fifteen days, and during this period the patient would be developing the disease himself. It must also be remembered that the treatment itself, consisting as it does of active attenuated virus, is not without some danger. Statistics covering about twenty years show that less than 1 per cent of patients treated show any ill effects from the treatment. Therefore, viewing it from all angles, we have felt that these facts should be presented to the patient, and he himself should make the decision concerning treatment. To be entirely fair to ourselves and the patient, we feel that we cannot be expected to assume all the responsibility.

The proper procedure in cases of animal bites is to quarantine the animal for a period of 14 days. We know that virus may exist in the saliva of animals several days prior to the development of symptoms. We have instituted this quarantine procedure and no animals have died of rabies later than the seventh day. While it is advisable to begin treatment at the earliest possible moment, it is probably safe to expect that if treatment is begun within ten days it will be effective.

FECES

The collection of specimens of feces to be examined for ova or parasites is very simple, but certain features are worthy of mention.

(1) It is not necessary to procure a large sample, and unless the patients are definitely instructed in this respect, they will very frequently bring in enormous quantities.

(2) Formed stools are to be preferred for the following reasons: they are usually less malodorous than fluid stools, gas does not form so readily and blow out the stoppers from the containers and, furthermore, the eggs in liquid stools have a tendency to settle to the bottom and stick on the sides and bottom of the containers. The outfit we use consists of a one-ounce ointment box, a wooden tongue depressor to handle the specimen and a data blank. The inability to find ova or parasites in one specimen does not preclude the possibility of infestation of the intestinal tract with parasites.

DAIRY PRODUCTS

This is a problem which confronts only the health officer, and all that need be said

is that chemical tests are so much more definite than the various bacteriological procedures that the results obtained can be judged by the experience of the chemist performing them. As to the proper collection of samples for bacteriological examination, little need be said. If the products are delivered in bottles, unopened bottles should be obtained. If the samples must be taken from a large can, the contents should be thoroughly mixed by means of a sterile stirrer, and at least 10 c. c. should be taken by means of a sterile pipette into a sterile container.

WATER

Board of health laboratories are called upon to make chemical analyses of water from a sanitary standpoint. The minimum quantity needed for this analysis is 2 litres. The results of a sanitary chemical analysis of water must be interpreted only in the light of additional knowledge gained by a field survey of the water shed or local conditions, and a knowledge of the character of waters from that locality.

In the collection of samples of water for bacteriological examination, 100 c. c. is sufficient for the ordinary routine bacterial count. Samples for bacteriological examination should be taken in sterile, glass-stoppered containers of the proper capacity supplied by the laboratory doing the test.

The following rules obtain for the length of time which may be allowed to elapse after taking the sample and the beginning of its analysis:

Chemical analysis:	
Ground water	72 hours
Fairly pure surface water	48 hours
Polluted surface water	12 hours
Sewage effluents	6 hours
Raw sewages	6 hours
Bacteriological examination:	
Samples kept at less than 10° C.	24 hours

PROPHYLACTIC PROCEDURES

Unless the board of health maintains clinics to which people can apply for various prophylactic injections, it evolves upon the laboratory to perform this duty. It is certain that the board of health should have a central point to which people can apply and obtain such services. Concerning certain diagnostic skin reactions such as the Schick test and the tuberculin reaction, this duty would also fall upon the laboratory where an epidemiologist is not employed.

CONCLUSIONS

In conclusion let me state a few broad principles which will prove of value to the physician, health officer and laboratory alike:

(1) Submit properly obtained samples.
(2) Give as much data as possible.
(3) Bear in mind that a great many tests have only a positive value.
(4) Interpret laboratory results only in the light of other clinical findings.

DISCUSSION

Dr. William Litterer, Nashville, Tenn.—Misery likes company. I heartily agree with practically everything Dr. Bean has stated. One has no conception of the trials and tribulations that a laboratory man has in dealing with some physicians, who, in every other respect, are intelligent; but in sending specimens, they are impossible. It is certainly surprising to see some of the specimens that are sent in, and from which they want a diagnosis. Not very long ago a specimen of blood, soaked in a piece of filter paper, or rather blotting paper, was sent in, with a request for a diagnosis of cancer, pellagra or smallpox. That is an actual fact. I have it on exhibition. However, we think that the physicians are showing marked improvement.

One point which Dr. Bean did not mention in his paper, and that is in the collection of vaginal smears. Nine out of ten physicians do not know how to collect them. They will take a vaginal smear improperly, regardless of the directions on the back of the slip. Then again, the collection of the spirochete on slides I think is absolutely useless when made by the average practitioner. It is with the rarest exception that I find the spirochete when so collected regardless of instructions so explicitly given.

Concerning malaria I may say that we do not get much of it in middle Tennessee. We receive a hundred or so every six months, which is not very many; but of those slides that come in, many are improperly made.

A certain amount of trouble is experienced with blood for the Wassermann test. Very often such a blood is hemolyzed, especially when sent in during the summer time. Instructions are given to send all bloods for Wassermanns by special delivery mail and to collect them as near train time as possible. We are using the Sachs-Georgi and also the Kahn flocculation, or precipitation tests as controls. Thus far we find that they are quite satisfactory.

I concur absolutely with what Dr. Bean says in his discussion of rabies.

Dr. Bean (closing).—The examination of smears for spirochetes I have not encouraged. In fact, if a physician sends in a patient to our laboratory, I tell him that we have no dark field apparatus. In fact, I do not believe that a public health laboratory should interfere with this work, as I believe the proper place for the free examination of such specimens is in the venereal disease clinic.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

THYROIDECTOMY UNDER LOCAL ANESTHESIA*

By Carroll W. Allen, M.D.,
New Orleans, La.

In presenting this subject I feel I can best serve its interests by confining my remarks to those steps of the operation which pertain to local anesthesia.

As a general thing I prefer local anesthesia in all cases without exception, both the colloid and the exophthalmic types. The size of the goiter is no contraindication. If the case can be operated upon at all, it can be more safely operated upon under local anesthesia.

In presenting the subject in this way I am not unmindful of the advantages, in bad risks, of ligation of one or more poles of the thyroid as a preliminary step, and I frequently make use of this practice.

We can best perform any operation under local anesthesia when we possess a thorough knowledge of the nerve anatomy of the parts involved. The skin, platysma and fascia which overlie the thyroid receive their nerve supply from the superficialis colli, a large nerve which is formed by the second and third cervical. It passes forward around the sterno-mastoid, about its middle, and runs forward beneath the platysma, dividing into two branches. The lower branch is distributed to the tissues over the thyroid, the upper branch between the thyroid and the chin.

The muscles and deep fascia which surround the thyroid receive their nerve supply from the loop formed by the descendens hypoglossi and communicans hypoglossi and a branch from the second and third cervical. This loop descends on the carotid sheath and gives off branches just above the thyroid which pass down under the sterno-thyroid and sterno-hyoid muscles supplying them and the fascia around the gland.

The under surface of the gland is supplied by branches from this same loop given off just beneath it in addition to several filaments from the deep cervical nerves in the neighborhood. In addition to these nerves there is a large branch derived from the deep cervical plexus which courses forward around the trachea in close contact with the cricoid cartilage supplying the tissues around the isthmus of the gland. I have found this nerve often of large size and fairly constantly present, but have not found it described in our anatomies.

A thorough knowledge of the nerve supply is essential, as it saves time in making injections and permits us to use a minimum of solution in the right place. And in the event of some discomforts being felt during the operation we know at once from its location the nerves involved and know best where to make additional injections.

From a consideration of the above nerve supply we see that regional anesthesia is possible in the hands of skillful men, but is not at all likely to prove popular with the average surgeon. To accomplish it the superficialis colli is injected where it curves around the posterior surface of the mid portion of the sterno-mastoid. A deep injection must now be made along the anterior surface of the transverse processes from the third to the fifth, inclusive. In stout necks, these land marks may not be readily recognized, and in all cases care must be exercised not to injure the deep vessels which lie on these processes. This last injection, if properly made, will reach the deep cervical plexus, but is not likely completely to anesthetize the descendens and communicans hypoglossi. To reach these last, it is preferable to wait until the skin and platysma are divided and dissected up, thus permitting a more ready access to the deeper parts. A long needle is then passed up under the sterno-hyoid

*Read in Section on Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

and thyroid muscles just above the thyroid gland to inject these last nerves in this position.

It will be seen that this method is more complicated and requires more time and a greater quantity of anesthetic solution than the more direct method of infiltration which I always make use of and which is outlined below.

The patient is allowed surgical liquids the morning of operation and is given a hypodermic of morphin gr. ¼ and scopolamin gr. 1/150 one hour beforehand.

A small intradermal wheal is produced with a fine needle over the center of the gland in the middle of the neck. A large syringe, about 5 c. c., with a long fine needle is now used. The needle should be about four inches long and have a short sharply beveled point. This needle is entered through the intradermal wheal and passed down to the deep fascia with the object of getting beneath the platysma muscle, the known position of the branches of the superficialis colli nerve. In this position its point is turned outward and slightly upward toward the superior pole of the gland. The needle is slowly passed outward in this position, injecting the solution as it is being advanced. The amount of solution will depend upon the size of the gland. If it is as large as a small grape fruit, 5 c. c. will be sufficient. If the syringe has to be refilled it is detached and the needle is allowed to remain *in situ*, thus avoiding an additional puncture. The needle is withdrawn sufficiently to direct its point in the opposite direction and the other side of the neck is similarly injected. The long needle is now withdrawn and a small syringe and fine needle used to produce an intradermal line of anesthesia along the proposed course of the skin incision. The deep injection is purposely made first so that it has time to diffuse while the skin is being injected.

The tissues are now incised the entire length of the field down through the platysma. If it is preferred, the skin only can be divided and dissected up, dividing the platysma and deep fascia on a different level.

Having made this first incision down to the sterno-hyoid muscle, the superficial tissues are dissected up, exposing the field. The long needle and large syringe are now used again, passing the needle down under the sterno-hyoid and sterno-thyroid muscles into the tissues above the superior pole in the direction from which the fibres from the descendens hypoglossi come, injecting all the way as the needle is being gently and gradually advanced, until a point is reached about one-half to one inch above the superior pole, injecting about 5 c. c. at each of these points on each side.

On making injections in the direction of any large vessels the needle should always be very gently inserted, stopping if any resistance is felt. It is also well to aspirate at short distances by withdrawing the piston of the syringe slightly, when if a vessel has been entered blood will appear in the syringe. While this incident should not happen if the technic is correct, no damage will result if the needle is of the proper kind and has been handled gently.

Having made the above injection on both sides, it is well to stop now and ligate all bleeding points, freeing the field of all forceps and getting rid of their weight on the patient's neck. This slight delay here permits the solution just injected more thoroughly to diffuse.

The muscles overlying the gland are now separated in the mid-line and either retracted, or divided as necessary, freely exposing the surface of the gland.

The outer margin of the gland being well exposed, a little traction is exerted, slightly raising it from its bed and rolling it in toward the mid-line. A finger is now insinuated beneath its margin, which further aids in the elevation. This finger feels out the carotid vessels which lie beneath so that they are below and on the outer side of the tip of the finger. In this position the long needle is passed over the tip of the finger between it and the gland and the tissues under the gland lightly injected. The opposite side is treated in the same manner. An additional injection is now made on each side of the trachea just above the isthmus to reach the nerve branches described as coming forward in contact with the cricoid cartilage.

If the gland is very large, additional injections may be necessary just below the inferior pole, but ordinarily this is not necessary.

This completes the anesthesia. The subsequent steps of the operation can now be carried out by any technic preferred by the operator. I always prefer first to divide the isthmus and roll the gland away from the trachea, thus avoiding any traction on this point which might produce a sensation of choking quite unpleasant to the unanesthetized patient. This is contrary to the usual method of operating here under general anesthesia, but has the advantage of increasing the mobility of the two halves and as they are rolled away from the trachea a much better view of the under surface is obtained and all injury to the recurrent laryngeal absolutely prevented. Except for this variation, the technical steps are identical with those usually followed.

The essential steps in this operation as in all others under local anesthesia are a thorough knowledge of the nerve supply. The ligation of all bleeding points at several stages of the operation just following the injection of fresh areas, allowing the solution to diffuse while ligation is being done and ridding the field of unnecessary weight and encumbrance. We work from the trachea outward, instead of in the opposite direction as is usually done.

The solution used is of secondary consequence, provided it is an efficient and safe local anesthetic, but novocain 0.5 per cent in 0.4 per cent NaCl is preferred, with about five drops of adrenalin solution to each ounce, provided not over four ounces is used. If more is needed the adrenalin is reduced. The cardiovascular stimulation of adrenalin is dangerous in exophthalmic cases and should be reduced to the minimum.

DISCUSSION

Dr. Robert B. McIver, Jacksonville, Fla.—The technic of thyroidectomy under local anesthesia has been completely covered from the standpoint of the operator himself. I should like to say a few words regarding the various preparations for the operation, first, the preparation of the solutions.

We have followed Dr. Crile's method. The novocain (0.5 per cent) is freshly prepared and boiled the day preceding operation and boiled again for ten minutes the day of operation. The quinin and urea (0.167 per cent) is prepared on the day of operation and boiled for ten minutes at that time. To avoid confusion in the cases of exophthalmic goiter, adrenalin is not added to the novocain in any case of thyroid under local anesthesia. If we decide at the time that adrenalin is to be used it is added by the surgeon himself. Quinin and urea are used routinely and we have seen no evil result.

Second, I wish to discuss the preparation of the patient and the operating room. As outlined by Dr. Allen, the patient is prepared for one or several days in advance. The morning of operation he is kept in a dark, quiet room and hypodermic morphin begun one hour in advance. It is our custom to use scopolamin in conjunction. The patient is placed upon the operating table, in proper position, and made comfortable. A cold, damp towel is then placed over his eyes and he is transported to the surgeon quietly, being scarcely conscious of the change. The surgeon, assistants and nurses are scrubbed up and ready in advance. Absolute silence prevails. If any word be necessary it is spoken by the operator only. The case is ready for successful work under local anesthetic. It is by no means an uncommon experience to have a patient sleep during the entire surgical procedure.

In thyroid work we have abandoned the semi-upright posture and now use the prone position with the neck extended, as pictured in Dr. Crile's recent book.

ENTEROSTOMY*

By Earle Drennen, M.D.,
Birmingham, Ala.

It has been said that curettage of the uterus is the most abused operation known to surgery, in that it is often performed when not indicated. Enterostomy, on the other hand, is the most neglected of operations, often being left undone when it would save life. Its performance is practically limited to three conditions:

(1) Obstruction of the bowel. This is by far its most common use.

(2) For feeding of starvation cases due to carcinoma of the esophagus or stomach.

(3) Rarely, in anastomosis of the large intestine, to allow the escape of gas.

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*Read in the Section on Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

We can probably all remember cases that died from unrelieved obstruction, or cases which were unable to stand a second anesthesia and laparotomy, dying a few hours after it was performed.

Obstruction that follows a few days after any abdominal operation can be promptly relieved by this little operation. Obstructions of this nature are nearly always due to a plastic adhesion of fibrinous material, which will disappear in from three to eight days, with complete relief of the obstruction, if the patient can be kept alive as long as that, and enterostomy allows such patients to live. If a patient is to survive, he should be relieved not later than the third day of the obstruction,

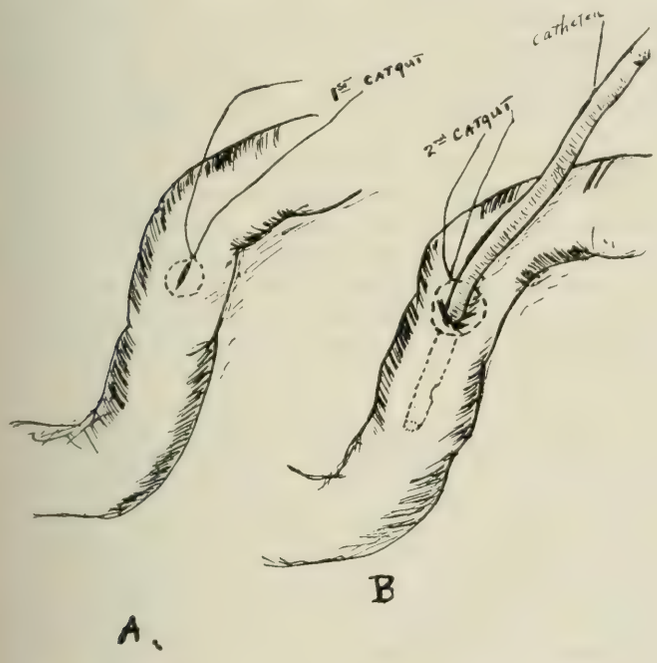

Fig. 1.—Steps in ordinary enterostomy for acute obstruction.

since later than that the combination of shock, toxemia, vomiting, loss of fluid and strength make recovery very doubtful.

The operation is very simple. Under novocain anesthesia, it can be painlessly, easily and safely carried out. There is a slight difference in technic, depending upon whether for feeding or for the relief of obstruction. Coffey's operation is better for feeding cases. A loop is selected high up in the left upper quadrant of the abdomen. Opposite the mesenteric attachment an incision is made for about one and one-half inches in the long axis of the gut down to the mucosa. The mucosa is punctured at one end, a catheter inserted into the lumen of the gut, being fastened with a purse string suture of cat gut, and the divided layers of the intestine being whipped over the catheter to form a sort of tunnel.

In the operation for obstruction, the gut being dilated and its wall very thin, it is better to employ two purse string sutures of cat gut, tying the innermost first, and then gently invaginating the catheter as the second is tied. Then the omentum is

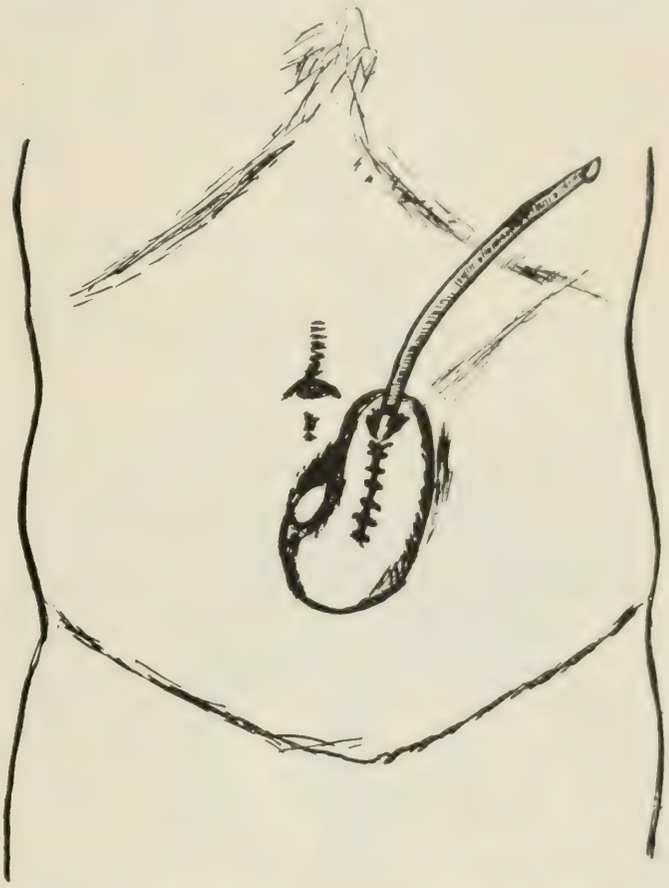

Fig. 2.—Coffey operation, showing catheter buried in wall of gut.

placed between the gut and the abdominal wall, a procedure recommended by Dr. Charles Mayo.

The catheter perforates one or two layers of the omentum, which is stitched to the parietal peritoneum. This use of the omentum facilitates closing of the fistula, and, better still, permits the gut to retain its mobility to a large extent.

The operation can be performed with the patient in bed, ordinarily requires about fifteen minutes, and there is no shock whatever to the patient. Usually there is an immediate escape of one or two quarts of foul, thin fluid and much gas.

Vomiting stops as if by magic and fluids are retained at once. The tube is left in until feces are passing per rectum, when it is withdrawn. Healing of the fistula usually occurs in from four to seven days.

A good rule for deciding whether to wait or operate in suspected intestinal obstruction is, if in doubt, operate. The same rule applies to the performance of an enterostomy. If there is any doubt as to whether or not it should be performed, it should be done. The little operation can

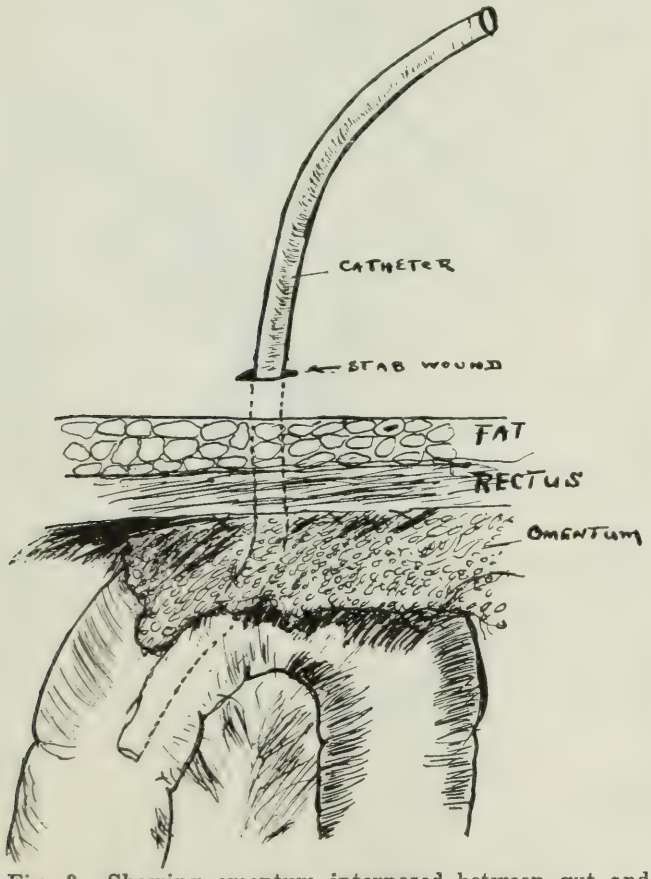

Fig. 3.—Showing omentum interposed between gut and abdominal wall.

do no harm; but until surgeons realize the value and simplicity of it, they will continue to have their minds filled with vain regrets over the loss of these patients instead of rejoicing in their recovery.

Enterostomy is a life saver.

DISCUSSION

Dr. Edward T. Newell, Chattanooga, Tenn.—The greatest thing that can happen to the patient and for us, after a laparotomy, is a free bowel movement.

The conditions requiring enterostomy should be diagnosed early, which is very difficult in cases where there is a partial obstruction. Where there is a perfectly frank case, the diagnosis is easy and the line of procedure perfectly plain. There is nothing to do but operate in those cases. Open the original incision if there is no abscess, and if there is, go in at the side of it.

For partial obstruction, there is no condition where a nurse has a greater responsibility than in indicating to the surgeon whether or not he needs to do an enterostomy. Neither the average nurse in training nor the average graduate nurse is capable of interpreting these cases; but she is often the one whose statements decide the matter. I always make it a plan in doubtful cases to see the stool. Often the obstruction is high and feces are passed from the bowel below the obstruction. The nurse will tell you that there was a good bowel movement and you feel satisfied for the time being. Instead of operating at the end of twenty-four or forty-eight hours following the obstruction, you operate at the end of seventy-two hours, often after fecal vomiting has developed. This condition is not an indication for operation; it is an indication of death. So it is very important in these partial obstruction cases to examine the stools yourself.

Dr. Drennen has given the accepted technic of the Coffey method in which you cut down to the mucosa and make an oblique opening into the lumen. You get a valve-like opening similar to the one in implanting ureters into the bowel. By this method there is a rapid healing of fistula, but it is not always practicable and suited to each case.

Dr. Long has a simple operation. He uses the cautery instead of the knife for opening the bowel. Where local anesthesia is used, and it generally should be used in these cases, it is very satisfactory. You put in a purse-string suture and burn through the bowel with the cautery, then put in another purse-string further out, infold the peritoneum and invaginate. This last point is very important, for, if it is not observed, you may get a fecal fistula that will require a secondary closure.

If you go into a large, distended abdomen, do an enterostomy and find an obstruction you may puncture the intestine and find a lot of gas and feces that have been tied up. You may wish to relieve it then and there and begin to massage and milk the intestines to get all of the contents out.

I do not know of anything that is worse or that will come nearer destroying an otherwise successful precedure than to massage and manipulate to get out the gas and feces in a case of this kind. If there is not enough peristaltic wave left to get out the remaining contents of the bowels, what you do will not save the life of the patient, but will destroy it.

My third and last point is a plea for better operative technic in laparotomies, whereby we

may have fewer obstructions following our work and less need for this operation.

Dr. J. Wesley Long, Greensboro, N. C.—There are two general classes of ileus following operation. One is the adynamic type of ileus which I sometimes call the "silent abdomen." The other is the kind that is characterized by active peristalsis. The peristalsis propels the gas along with more or less force to the point of obstruction, causing it to make a tinkling, rumbling, gurgling noise sometimes quite high pitched and resembling musical notes. I sometimes compare these sounds to the ringing of fire bells. I use the stethoscope in diagnosing ileus. If all is silent, if I hear no sound, I expect nothing from the enterostomy. Enterostomy will rarely save a patient in whom the peristalsis is in abeyance, but if you hear the musical notes produced by the peristalsis you can go in with confidence. The fire bells are ringing for the surgeon and if he is not alert and does not come to the rescue the patient will be destroyed. Enterostomy is a simple procedure and I would not criticise the method brought out by the essayist, for it is excellent. But in many cases you cannot put the clamp on. In these cases put a purse string around and stick the point of a very small cautery into the intestine.

It is important to bring the omentum up between the enterostomy point and the abdominal wall. If you can surround your enterostomy fistula with omentum it will not leak after the tube is removed. Unfortunately one cannot always get the omentum, but always when possible search for it and if you can secure it you will not have a permanent fistula.

The two things which I would stress are the value of auscultation in suspected ileus, and, second, the value of the use of omentum in safeguarding the enterostomy opening.

Dr. J. Shelton Horsley, Richmond, Va.—The diagnosis of obstruction is usually better made by the oral end than the rectal end. If a patient continues to vomit, if an accumulation of fluid can be determined by the stomach tube, no matter what other examinations may show, that is very suggestive of obstruction. Obstruction of the upper part of the abdomen is much more rapidly fatal than in the lower part, and the relief must be made more complete. In the animal if you divide the upper jejunum and bring the distal end up and suture it to the skin as in an artificial anus, the dog will die very promptly from obstruction. That has been proven by Dragstedt of Chicago. If a tube is inserted the dog will survive. In the lower ileum the dog will survive this procedure without the tube. In the upper jejunum the muscular contracture of the abdominal wall will produce an obstruction that will be fatal. In the lower ileum it will not. We know that the cause of obstruction should be removed as soon as possible. An obstruction in the small intestinal tract can be relieved just as well by inserting a small tube, as shown by the essayist, as by inserting a garden hose, which will leave a large fistula through which feces will flow indefinitely. If the bowel can be delivered into the wound, I think the plicating method, the Coffey modification, is exceedingly good. Dr. Long's method is also good.

I make it a routine to do an enterostomy in every resection of the large bowel. If the transverse or left colon is involved I make a separate muscle-splitting incision and insert a catheter with an opening at the end and about half way between the eye and the other end through an incision in the ileum and through the ileocecal valve. In this way there is an outlet from the cecum and the ileum, the distension is relieved and the patient is kept comfortable. The content of the small bowel is always fluid and will flow through the small sized catheter as well as urine will. In this way you rarely have any fecal fistula.

PYELITIS IN PREGNANCY*

By Erasmus H. Kloman, M.D.,
Baltimore, Md.

In the strictest sense pyelitis is an inflammation of the mucous membranes of the calices and pelvis of the kidney; whereas, in pyelonephritis the inflammation affects the parenchyma as well. Ureteritis is a rather uncommon word and is not generally associated in one's mind with ordinary pyelitis. I shall attempt to show that there is frequently a ureteral association with pyelitis, and that a mild cystitis usually accompanies the pyelitis in pregnancy. The pathological definition has no real value when it is borne in mind that pyelitis means an inflammation of the pelvis which may have an extension to the parenchyma as well as down the ureter, including the bladder. The Bacillus coli has been known for some time to be by far the most common infecting organism. The portal of entry is usually through the blood stream and there is probably some form of lowered resistance in the urinary tract which determines the infection. For this reason pregnancy with its extra pressure is frequently credited with being the exciting cause.

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*Read in Section on Obstetrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Kelly states:

"If the flow of urine from the kidney into the bladder has been interfered with on one side, as in the case of the pregnant uterus, or on both sides, as in prostatic hypertrophy, the result is to render the involved kidneys peculiarly liable to infection. This occurs through the blood. If such a case comes to autopsy one finds a fairly normal looking kidney, but marked disease of the pelvis and ureter. Clinical studies demonstrate beautifully, however, that such kidneys are far from normal: in many cases the secretory power is reduced almost to nil."

There may have been a long standing stricture which has been causing little or no trouble until the extra work of pregnancy arrives. This would certainly seem plausible in the early cases, which occur before the uterus has become an abdominal organ.

I wish to report several cases, which suggest that ureteral stricture may be an important underlying factor in many cases of pyelitis of pregnancy.

I have selected a series of 28 cases of pyelitis in pregnancy seen by me in the past five years, seven of which cases required treatment other than medical, and ten of which have subsequently proved to be stricture cases. Four of the 28 cases were examined for stricture and found to have normal ureters. The seven cases requiring treatment other than medical were treated by dilating the stricture and by pelvic lavage. The remaining 21 cases were treated medically; that is, forced water, hexamethylenamin and some alkaline diuretic, which sufficed to take them through pregnancy.

CASE REPORTS

Case I.—Mrs. A. Z., 24 years of age, white, para 1, was referred by Dr. George Settle. She gave a history of irregular menstruation. She had missed one month and had had two operations, one for inguinal hernia four years previously and one for retroversion and ovarian cyst two years previously. On each occasion she complained of pain on the left side, which had never entirely disappeared, and at the time that I saw her it was very severe. The pain was in her back and extended down the left side to the bladder region. She had been bleeding for four weeks, had much tenderness in the lower abdomen, over the uterus and in the left side, much pain on urination, and rose frequently at night to empty the bladder.

Pelvic examination showed bloody discharge and a suspicious mass on the left side, with a uterus which felt about three months pregnant. The patient was sent to the Maryland General Hospital with a tentative diagnosis of ectopic pregnancy. Catheterized specimen showed bright red bloody urine, which, under the microscope, was almost pure blood with many pus cells.

Second physical examination showed normal three months pregnant uterus. Dr. Guy L. Hunner was asked to see this case and in making a cystoscopic examination found almost pure blood coming from the left ureter. A No. 8 catheter with a wax bulb 3½ mm. in diameter was passed and the kidney pelvis washed with 1-1000 silver nitrate solution. That caused the patient to complain of her old pain in the left side. The bleeding almost instantly disappeared and the patient was able to continue with the pregnancy to full term and she had a normal delivery and a living child. In a few months the same pain became severe and blood was noticed in the urine. She was sent back for treatment. A series of treatments, dilating the stricture, which was 9 cm. from the external meatus of the urethra, caused complete cessation of the bleeding and relief of pain. A second series of dilatations caused complete cessation of pain and clearing up of the pus cells as well as a sterile urine, which up to this time had repeatedly grown the Bacillus coli.

Case II.—Mrs. V. Z., a married Lithuanian, 30 years of age, para 3, was referred by Dr. Skladowsky.

At the third month of her previous pregnancy she had been seized with a great deal of pain in the left side and had frequency of urination and bladder pain. A diagnosis of pyelitis was made by her family physician, who gave her forced liquid and hexamethylenamin with some bladder mixture. She failed to improve, and began to go down hill, having chills and temperature of 105°. At that stage she was seen by me at the Maryland General Hospital.

Cystoscopic Examination.—The urethra was dilated to the size of a No. 9 sound, taking a No. 9 cystoscope. The bladder was slightly congested around the vault and over the trigone. The left ureteral orifice was congested and spurted urine that was milky in color. That side was catheterized with a No. 8 catheter, carrying a wax bulb 3 1-3 mm. in diameter. The catheter entered with some difficulty. The kidney pelvis was washed with 1-1000 silver nitrate solution after a specimen and culture had been taken. The pelvis held 30 c. c. and returned it rapidly. On withdrawing the catheter the patient complained of severe pain where there was a definite hang of the bulb at the broad ligament area.

Impression.—Pyelitis of pregnancy with a stricture of the ureter, causing hydronephrosis.

Microscopic Examination.—Bacillus coli in the presence of a large quantity of pus. This patient received three similar treatments until the strictured area had been dilated to a bulb 4 1-3 mm. in diameter.

Treatment was given every week or ten days and the patient was kept on forced water. By the end of the fourth treatment she was very much relieved, but still had a Bacillus coli in-

fection with a few pus cells. The kidney pelvis at that time held 15 c. c. and the patient was able to go on to full term with normal delivery. She had repeated attacks of pain with occasional temperature for six or eight months after labor, when she again returned for treatment. When the stricture was dilated, the pelvis held 15 c. c., but the Bacillus coli was still present. After the fourth treatment, the pelvis held 8 c. c. with sterile culture free from pus, and the patient was well of all pain.

Case III.—Mrs. H., Kinston, N. C., white, 30 years of age, para 4, was referred by Dr. F. S. Whitaker. She complained of pain on the right side, fever and chills with much burning on urination. She gave a history of one miscarriage and two premature labors, still-born, each labor coming on following the same condition as the present one. Her past history was otherwise negative. The patient had very bad teeth and tenderness over the right kidney, which was distinctly palpable and somewhat enlarged. The patient was seven months pregnant and had been suffering for the preceding four weeks with pain in her right side and back. The pain extended to the bladder, causing much frequency. She had to empty the bladder four to six times every night and had nausea, chills and fever with a temperature of 102° and pulse 120. The leucocyte count was 22,000, the urine containing many pus cells, few red blood cells, and the bladder specimen grew Bacillus coli.

Cystoscopic Examination.—This showed general congestion, worse around and over the trigone with thickening and redness over the right orifice, looking somewhat like tuberculosis. The left orifice was normal. A No. 8 catheter was passed with wax tip and a 3 1-3 mm. bulb. Specimen and culture were taken. That looked cloudy, contained pus and grew Bacillus coli. The kidney was washed with 1-1000 silver nitrate solution. It took only 3 c. c., returned this quickly, and it caused much pain. On withdrawing there was a definite hang in the broad ligament area, again causing pain, which the patient then admitted was in the same place and of the same character as her former pain. This suffering continued for several days, when the temperature went to normal. The patient had forced water during that time. After four treatments, eight days apart, she was free of pain and bladder symptoms and returned home, where she had a normal delivery of a living child. It is interesting to note that she had been treated for pyelitis during the previous pregnancies with forced water and hexamethylenamin, without any cessation of symptoms. Her leucocyte count was 12,000 after four treatments and the urine was negative.

Case IV.—Mrs. L. I., white, 31 years of age, para 1, was referred by Dr. H. U. Todd with a diagnosis of hyperemesis gravidarum.

She was three months pregnant, had a cystitis with many pus cells which cleared up under forced water and 5 per cent sodium bicarbonate solution by rectum. She was able to go along with pregnancy until eight months, when she returned to the hospital with eclampsia. A cesarean section was done, which resulted in the recovery of mother and child. At that time the urine showed many pus cells with Bacillus coli infection. Two weeks after the patient left the hospital she complained of pain in the right side and back. A No. 8 catheter with 3 1-3 mm. bulb revealed a dense stricture at the bifurcation of the iliac artery. There was complete relief after six dilatations, when the culture became sterile.

I shall mention another case which was not completely worked up, but is interesting as a case of eclampsia with pyelitis. This patient, Mrs. K., was referred by Dr. Ruzicka, came to the hospital in eclampsia, and had a cesarean section at once. Mother and child both lived. The patient ran a temperature of 103° with chills and pain in right side for the first three or four days. A catheterized specimen showed Bacillus coli with many pus cells. She was treated with forced water and left the hospital much improved. Since that time, however, she has had a return of the pain, but her physician was unable to have her return for treatment, and at present she is threatened with an operation to remove her appendix.

Case V.—Mrs. G. M. E., white, 23 years of age, para 1, was referred by Dr. Macks. The first admission was in 1918, when she complained of being nervous, having a dizzy feeling and pain in the back. The pain was intermittent in character, extended to the right lower abdomen, and was sometimes sharp and shot down the right leg. It had been present since the birth of her child one year previously. The first attack was while pregnant.

Physical Examination.—This showed a right inguinal hernia, palpable right kidney, retroverted uterus, slight tenderness over the appendix and the urine showed a few pus cells. The operation performed by me was suspension of the uterus, appendectomy, right inguinal hernioplasty and dilatation and curettage. The patient was better for three years, but always complained of pain in the right side and backache. She returned to my office in February, 1921, complaining of backache and pain in the right side extending down the right leg, and frequency of urination, especially at night. At that time she recalled a trace of blood in the urine while pregnant and again about six months previously. She entered the Maryland General Hospital May 24, 1921, with a typical attack of renal colic. X-rays showed a small stone low down in the right ureter. A No. 8 catheter was passed with 3 1-3 mm. bulb with a successful delivery of the stone. A catheter was again passed, which showed a definite stricture at the broad ligament area. The patient refused further treatments, claiming that they were too painful. Consequently she still has her old pain despite the fact that she has become a "Christian Scientist."

Case VI.—Mrs. L. C., 24 years of age, para 1, was referred by a nurse. She complained of severe pain in the left side and was four and a half months pregnant.

Her family history was negative except that her mother died at the age of 20 years in confinement.

Past history showed tonsillitis, but was otherwise negative.

Present illness began March 21, 1919, when she was four and a half months pregnant. She had a feeling of pressure just above the symphysis and a great desire to urinate. She did urinate, but at the end of the act felt as if there were some more urine in the bladder but that it could not come out. She had polyuria at that time. She had pain in the back on the left side which radiated to the bladder and she felt nauseated and vomited easily.

A definite pain developed in the left kidney region, which was very severe and relieved only by opiates. Pain of the same sort recurred at short intervals, but was not very severe. The urine during that time was cloudy, but not bloody. There was polyuria just before the abatement of the pain.

Cystoscopic examination showed congested bladder and trigone. The left ureter was catheterized with a No. 8 catheter. A specimen and culture were taken, and the kidney pelvis was washed with 1-1000 silver nitrate solution. The specimen showed pus cells and the culture grew Bacillus coli in mixed infection. Two more treatments with bladder irrigations of boracic acid, leaving in 1 oz. of 1-1000 silver nitrate caused the acute symptoms to subside. The temperature became normal and the patient remained fairly comfortable until July 7, 1919, when she was admitted to the Hospital for the Women of Maryland, three weeks before term. At that time she had severe chills, temperature around 102° and a great deal of kidney and bladder distress. Induction of labor was attempted with castor oil and quinin without successful results. A large bougie was inserted into the uterus, labor started and terminated practically normally except for the kidney and bladder symptoms. Pyelitis continued, but was improved when the patient left the hospital two weeks later. In several months she had a severe attack resembling kidney colic which required morphin.

Ureteral examination revealed a definite stricture at 9 cm., but the patient has not recovered because she neglects treatments.

DIAGNOSIS

The question of diagnostic measures is possibly the gravest one in this paper. This immediately flashes to the mind the importance of thorough clinical histories, for here we get data that all the laboratory and x-ray reports cannot give. There have been and are today many pregnant women who are operated upon for appendicitis, gall bladder disease and pelvic conditions, when pyelitis is the disease causing their symptoms.

Women in the puerperium who have a sudden rise of temperature, often with a chill, many times puzzle the physician, who is looking with dread for a puerperal infection. The abdomen may be soft and free of pain and tenderness with only slight pain in one or the other side, and usually tenderness over the kidney area. These cases deserve a thorough examination of a catheterized specimen of urine at least to rule out pyelitis.

Less than a year ago I walked into the operating room of one of the best run hospitals of a large city, with excellent laboratory facilities, and saw a well trained surgeon removing a normal appendix from a pregnant woman. He asked me what I thought caused all the chills and temperature. I immediately told him that if the patient had chills she very probably did not have appendicitis, but very probably did have pyelitis. This led us to the laboratory, where a negative report had been hurriedly made on a catheterized specimen of urine, in which we found much pus, and on careful questioning we learned that the urine examination had not included a microscopic examination. This patient's chances of recovery were made worse, and at best she was not helped, by operation. This should be a lesson to the bold surgeon who constantly relieves the female of her appendix and inflamed organs without a thorough clinical history, physical diagnosis, laboratory examination and lastly, but not least, in many cases a careful cystoscopy.

The method of diagnosis I use has been more or less vaguely brought out in my report of cases. Like everything else in medicine, the diagnosis is the important feature. The treatment may be varied, with similar results, in different hands, which brings up the fact that pyelitis itself is more or less a self-limited disease which will clear up and remain clear for short or long periods, the time being due to the etiologic factor in most cases. The etiology of pyelitis in the majority of cases is hematogenous. It is caused frequently by remote foci which appear almost harmless at times, the three most evident of which are the tonsils, teeth and sinuses. The intestinal tract plays a more or less important part at times. The etiology of

pyelitis in pregnancy is somewhat different, as the patient may already have had a pyelitis, which was inactive. Hunner states that

"of his last seven cases of pyelitis developing during pregnancy or soon after delivery, three of which were bilateral, he was able to demonstrate stricture of the ureter in all but one case. This is probably a much higher percentage associated with stricture than we would find in a larger series. In most of such cases the stricture is probably present before the pregnancy and the added congestion of the tissues after conception sets up a slight hydronephrosis which becomes infected during pregnancy or immediately after.

"Some of the cases of pyelitis of pregnancy due to stricture clear up spontaneously after labor, after the congestion and edema incident to pregnancy have disappeared. Others continue as a chronic pyelitis until treated. Most cases of pyelitis of pregnancy which clear up spontaneously or after a few irrigations with silver solution, do so because a stricture is not present, or because the slight dilatation of the stricture incident to passing an ordinary renal catheter is beneficial."

TREATMENT

There has been much written on the surgical treatment of pyelitis of pregnancy. Edward P. Davis, of Philadelphia, gave an excellent review before the Section on Obstetrics and Gynecology of the American Medical Association, held at Atlantic City, June, 1912. He is a strong advocate of drainage by nephrotomy and forcibly brings out the importance of surgical interference before it is too late for both mother and child. Certain cases have been allowed to advance to the stage of grave illness where a nephrotomy was evidently indicated, and in other cases when an overwhelming mixed infection was present, the kidney has been allowed to become riddled with abscesses which resulted in pyemia or septicemia. It is the purpose of this paper to remind you that if we do not obtain quick relief from the more common therapeutic agents, such as forced water, hexamethylenamin and alkaline diuretics, it is our duty to find out by cystoscopy whether or not there is a definite damming up caused by a stricture or something else, and to encourage drainage by dilating and lavage with some antiseptic fluid, such as a weak solution of silver nitrate. This treatment, I believe, will at least attenuate the infecting organisms, allow freer drainage and stay the almost inevitable premature labor.

It may not cure the pyelitis, but this can be reckoned with later and if caused, as my experience has shown, by ureteral stricture, this can be cured by removing the nidus of infection and dilating the strictured area by graduated wax bulbs ranging from 3 1-3 mm. to 5 mm. in diameter on a No. 8 or 9 French ureteral catheter.

In conclusion, let me say that I have nothing new to offer as to the infecting organisms. The Bacillus coli is commonest and the staphylococcus and the streptococcus may be present. Far too many babies and mothers are lost by watchful waiting, and far too many laparotomies are performed for appendicitis, gall bladder and pelvic diseases where careful history taking with careful urine examination would have cleared up a diagnosis, for ureteral stricture plays a most important role in pyelitis activated only by pregnancy. These cases, taken before the patient threatens to abort, can be relieved by cystoscopy with pelvic lavage, dilatation, and drainage through the natural channels. After labor and the puerperium are over, most of these cases subside to be followed later by pain in the kidney region extending to the affected side and bladder, at which time removal of the nidus of infection and dilatation of the stricture will cause a permanent cure.

44 West Biddle Street

DISCUSSION

Dr. H. W. E. Walther, New Orleans, La.—The term "pyelitis of pregnancy" is often a misnomer, in that what we are actually dealing with is an acute exacerbation of a chronic pyelitis occurring during the pregnant state. These cases have had infected kidneys probably for years and the simple fact of the woman's becoming pregnant and the uterus' enlarging in the abdomen and falling backward produces pressure upon the ureters sufficient to give an acute exacerbation, fever and pain and the usual symptoms the Doctor has described. These patients are very ill at times, and certainly it behooves us to make a correct diagnosis.

The Doctor mentioned a point I wish to emphasize, and that is the importance of obtaining a specimen of urine and also subjecting that urine to microscopic study. These two points cannot be stressed too emphatically. In the past when we looked once a month for albumin we felt we

were doing our duty; but we have to go a step farther. We have to look at the centrifugalized, stained sediment.

Undoubtedly cystoscopic lavage must be resorted to in those cases that do not respond to the usual medical treatment given by mouth. I have not personally experienced much benefit from a weak solution of silver nitrate, such as 1-1000 or 1-50,000. I routinely employ 1 and 2 per cent, and I believe I save the patients some cystoscopies.

There is no doubt that drainage of the kidney by means of the catheter is good if it is prolonged for twenty-four hours, if it can be tolerated. The indwelling catheter helps appreciably.

I cannot agree that all these cases are due to ureteral stricture. I would rather call them cases of ureteral "obstruction." We have always known there was a pathological entity ureteral stricture, and we occasionally meet it, but that it is common, at least I and my associates and co-workers in New Orleans have not been able to substantiate. It is true that the urologist sees more of these cases, but I contend that many of them are ureteral obstruction, due either to pressure or kinks. Some of the lantern slides show very beautiful pictures of ureteral kinks, but to say that the kink is caused by the stricture I think should be turned around and we should say that the stricture is caused by the kink. I cannot, therefore, subscribe to the idea that stricture plays a very important part here.

One of the men this afternoon spoke of the small community man and his handicaps. I feel that in this condition many times cystoscopy is absolutely imperative to give the patient relief, and where one cannot get catheterized specimens, microscopic study and cystoscopy for one's patients, one should get busy and find some man in the community who will do this for the town. There is no substitute for this kind of work; and to say that this study cannot be obtained is reflecting on one's ability and the community.

Dr. Thomas B. Sellers, New Orleans, La.—During the past year I have had two cases of ureteral kinks complicated by pregnancy.

In the first case, I induced labor at the eighth month on account of persistent pain in the region of the right kidney. At times it was unbearable. During puerperium she was cystoscoped several times with great difficulty, followed by a severe reaction.

The second case went to term. I kept her in bed a greater part of the last six weeks of her pregnancy and also had her cystoscoped several times during that time, which seemed to give her a great deal of relief.

We must not forget the possibility of a hydronephrosis in these cases. If the pain and discomfort persist over a period of time, labor should be induced about the eighth month or earlier if indicated, as Dr. Kloman has already mentioned.

I am convinced that cases of chronic pyelitis with a kink due to ptosis of the kidney should be advised against future pregnancy, especially if they do not respond to treatment. My experience has been that surgical treatment (suspension of the kidney) is very unsatisfactory in the majority of cases. Should the abdomen be opened for any other reason I believe they should be sterilized.

Do not forget the possibility of a tuberculous infection in all chronic cases, with or without a ptosis of the kidney. We all know how hard it is to find the organism. Many times we have a mixed infection.

Dr. T. Brannon Hubbard, Montgomery, Ala.—I do not do obstetrics, but I am closely associated with a man who does a great deal of obstetrical practice. I have had some rather striking and gratifying experiences with his cases, treating them with the cystoscope. Some of these get well spontaneously or at least do not suffer a great deal, and some I have seen at the point of death. I have had one case along the line that Dr. Walther brought out, at about the eighth month, a woman who had been vomiting, with pyelitis and distension of the pelvis of the kidney. We kept the catheter in, intermittently, for ten days. There was much retention, and as long as the catheter was left in the nausea was relieved. That went on until she was delivered of a living child. I do not think it makes much difference at what time in pregnancy you get the case. Some of them present very difficult problems of diagnosis. I had one a month or two ago that was the most striking and perplexing from a diagnostic point of view that I have seen for some time. She was just about at term and had violent pain on the right side, and the obstetrician thought it was appendicitis. Her blood count was only about 12,000. It was a question whether she had acute appendicitis or acute pyelitis. He said, "What shall I do? If we operate and she goes into labor in a short time, it will be bad. If we do not, it will be worse." I catheterized the ureter, assuming that she had appendicitis. The urine gushed out and her pain was relieved. We left the catheter in for twenty-four hours and she was delivered of a fine child and got along all right.

I have a good many women patients, and I am one of those who believe in ureteral stricture. I am sure there are a good many such cases. I can show Dr. Walther cases which undoubtedly are ureteral stricture.

Dr. E. T. Newsom, Sheffield, Ala.—A rose by any other name is still a rose. It makes very little difference what we call the narrowed places in the lumen of a ureter. If that place is there, it is up to us to find out about it and say that it is there before instituting treatment medically or surgically.

One thing I would like to impress upon small town men, if there be any present besides myself, the men from the hills, as they have been referred to this afternoon. I have always been in a small town. I probably always will be unless there is a rapid increase in population before my death. I think that it is used too much as an excuse for not having instruments of precision, such as the cystoscope, with which to differentiate one

malady from another, and for not having the necessary equipment for prompt aseptic surgical intervention when such a procedure is indicated. I think we are all inclined to go East, and I go every time I have enough money to stay a while, and I sit there and listen to better men, who have had years of experience, talk while they work. In such instances I am not so much interested in the instrument they are using as I am in the mature judgment that is theirs from years of experience with a large number of cases. I would rather follow their methods of reasoning out a differential diagnosis than to know what kind of light they have on the end of their cystoscopes. The important part of differential diagnosis, the Alpha and Omega of our business, is careful history taking, painstaking physical examination, with no thought of loop knots or the way the suture is passed until we reach that point.

Dr. J. George Dempsey, New Orleans, La.—Physicians and operators are a little lax in their methods in not having the urine catheterized properly and following up their cases.

Few physicians insist upon the patient's reporting for subsequent examinations after a case of pregnancy.

If the previous condition of many of these cases were closely observed it would be found that the pus antedated the pregnancy, and that it was due to some other condition besides pregnancy.

Dr. Basil M. Taylor, Greensburg, Ky.—Dr. Kloman speaks of using nitrate of silver 1 to 1000. Why does he not use other preparations of silver such as we occasionally use in the bladder?

Dr. Walter E. Levy, New Orleans, La.—Does posture have anything to do with the relief of the condition?

Dr. H. A. Davidson, Louisville, Ky.—Do you use autogenous vaccines in any of these cases of pyelitis of pregnancy?

Dr. Kloman (closing).—Dr. Walther and Dr. Sellers both insist that my stricture cases are kinks, and Dr. Walther intimates my strictures are due to kinks. One of the cases I displayed on the screen showed definite kinks above the stricture area and I admit that it is debatable whether the stricture was first or the kink. Being a disciple of Dr. Guy L. Hunner, I have always believed that the kink follows the stricture. In other words, the stricture causes a hydronephrosis, which means a heavy kidney. The kidney drops and the ureter kinks. My chief reason for believing this statement is because when these cases have their strictures dilated the kinks disappear. There has certainly been no direct attempt to treat the kink.

The organic silver salts have been tried by many. Personally, I have gotten such good results from silver nitrate that I have no reason for trying other preparations. It is very essential, however, that the silver nitrate should be prepared with distilled water and kept in a dark container, comparatively fresh.

Autogenous vaccines have been tried by some, but I think without very gratifying results.

I was asked if postural treatment is beneficial. I nearly always keep these patients sitting up when they are ill, but I do not believe that postural treatment alone would do a great amount of good. There are certain mild cases of pyelitis that would be relieved by nearly any treatment where it is necessary to have rest. I wish to reiterate that the cases I have been speaking of have all been in very ill women.

USE OF THE LANE BONE PLATE*

By A. W. Ralls, M.D.,
Gadsden, Ala.

The author does not question the merit of other types of internal fixation of fractures in the long bones, nor does he wish to make extravagant claims for the Lane plate in simple and easy cases. Neither does he advocate indiscriminate and careless operative interference. Simple fractures mainly will be discussed.

A fracture is a surgical condition and there is a tendency of late years more often to apply laws of surgery and laws of mechanics, which in many cases can be carried out properly only by a good incision, careful inspection of the field, and accurate anatomic adjustment.

Some writers and operators in recent years report the use of the Lane plate with an apology. I have used it with satisfactory results for the past twelve years.

I have used a Geiger bone set since this mechanical contrivance came into use, and I have plated often with good results where an autogenous graft was not practicable. In July, 1909, soon after Mr. Lane's Atlantic City paper on the use of his plate, I followed his method in a large number of his bone cases in the London General Hospital. Disappointing results are had in many cases, because his technic of instrumental manipulation is not properly adhered to.

Many operators are capable of properly applying a plate who have not the training to do an inlay graft, and the Lane plate can serve a greater number of

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operators and patients than any other one method of internal fixation. In point of real service it eclipses all other methods.

History.—Sir Arthbuthnot Lane did his pioneer work in 1908 and 1909, and did not receive the endorsement of his colleagues, many of whom later heartily approved this method. Later came the Parham band, decalcified bone plate, Smith clamps and other similar devices, the object of each to produce as nearly as possible perfect apposition anatomically and immobility of the fracture seat.

The Lane plate is being used more the past three years than ever in its history. Our best results have been obtained in the femur, tibia, forearm, and the various condylar fractures of the elbow, particularly fractures of the elbow in children, either condyle, the T-fracture, or supracondylar. Our table includes thirty-two cases of fracture of condyles, without a deformity, without paralysis, without infection, and with perfect functional result.

This report is taken from our operative records covering a period of four years. There were 121 fractures of the long bones. Sixty-nine of this number were treated by internal fixation. Sixty-seven had a Lane plate applied, and in two cases a bone peg was used, one in the fracture of the neck of the femur, and another in a fracture of the head of the humerus. All were recent fractures except three.

The incidence of fracture as to location was:

26 fractures of the humerus	7 plated
33 condylar and supra-condylar	27 plated
27 femur-shaft	14 plated
24 tibia (fibula also 17)	13 plated
19 ulna	3 plated
17 radius	5 plated

There was one infection in a femur case, two in the humerus class, two in the tibia, and none in the elbow. There was only one case of non-union, and that was in the tibia. A second tibia case, a miner with severe maceration of the soft parts and comminuted fracture, had slight infection for two months. Both infection cases had much laceration and later sloughing of the soft parts. Two of the tibia cases were plated one week after accident. Both were compound. Both recovered function and union at the end of the second and third month. We did not have non-union in humerus, femur, radius or ulna.

In the infected cases the plate was removed about the end of the sixth week, but judgment was based upon skiagraphic reports.

One femur case had delayed union and one had slight bowing from early walking. Of the twenty-seven operative condylar fractures, there were fifteen supracondylar or T-fractures, three of the internal condyle and nine of the external condyle.

Of this twenty-seven cases the plate was removed in eleven. None of the above cases were secondary operations or so-called reconstructive cases.

Sir Rutherford Morrison, in a recent article, reports a large number of war injuries treated by himself in the Royal Victoria Hospital, in which he used the Lane plate freely, and to quote him, "with extraordinarily good results." In this very exhaustive article of Mr. Morrison many photos and skiagrams are shown in which he applied from one to three plates in many individual cases, on one long bone, and not infrequently he secured long internal bone grafts by means of the plate. He further states:

> "In the humerus and the femur I do not think any method of fixation can equal the metal plate if the bone is firm enough to hold the screws. If it were true that a plate prevented osteogenesis so that the graft could not unite, plates would of course be taboo. But this is not true and my cases prove it. . . . Lane plate fixation of bone grafts can be successful where other methods have failed."

Henderson, in an article on fractures of the femur, reports 122 cases of fracture of the shaft with 69 open operations. Of these 69 operative cases, the metal plate was used 58 times, or in 78 per cent of cases. I wrote Dr. Henderson, whose reply was:

> "Bone plating is not popular with many writers of today, but it has advantages in that it is easy to apply, and causes less shock to the patient. Sepsis is more liable to follow and the plate should be removed as soon as union is firm."

Mr. Lane is now using his plate in a greater variety of cases than ever.

Morrison reiterates old proverbs, in that if the surgeon does not feel that he

can do clean aseptic bone surgery, he should not attempt the use of the bone plate. He also repeats the old advice, that if the plate be long and large enough properly to splint the bone, external fixation is not necessary.

To my own mind the Lane plate more nearly approaches the fulfillment of the mechanical and physical laws embodied in this character of work than any device known. It should even have precedence over the graft, when great strength is required.

Doege, in an article of June, 1918, stated:

"(1) All simple fractures that are readily reduced by manipulation but show a distinct tendency to redisplacement are treated by the open method of reduction. (2) All simple fractures that cannot be accurately reduced by manipulation are properly adjusted by operation. (3) Only those fractures that have been reduced by the open method and which, after reduction, show a tendency to redisplacement, as determined by free passive motion performed while the wound is still open, are immediately plated."

He approves of "the routine removal of the plate in all cases where there is a possibility of irritation, or where the plate may act as an irritant to joints, tendons or nerves." This writer advocates, however, the removal of every plate as soon as it has performed its function, and, like the majority of writers on this subject, he also warns against operative interference where the soft parts are severely contused, whether the fracture be simple or compound.

Jonas feels that the individual work and phenomenal success of Mr. Lane alone has made the open reduction method popular beyond all others. He also points out the fact that Lane did not always mention the details of his perfect technic, and his exacting and painstaking aseptic procedure, hence many operators failed to realize the importance of keeping the fingers out of the wound.

Harrigan, in the *Annals of Surgery*, 1919, stated that he is an advocate and partisan of the Lane plate in certain types of fracture. He reports a series of sixty-two open operations for simple fracture on the humerus, femur, tibia, radius and ulna, with the use of the Lane plate in thirteen cases, or 20 per cent of the total cases. He stresses the oft-repeated cardinal point that no method of internal fixation hastens bone union and that the sole object of an operation is to secure anatomic reduction of a bone. His ideal indication for a Lane plate is a subtrochanteric fracture of the femur. Few will admit that any other type of treatment offers a reasonable hope for perfect immobilization in such cases. He states that certain types of fracture can be reduced and immobilized only by using the Lane plate. He also admits that the use of the Lane plate is decreed by many to be "dangerous and uncertain." A conclusion of these facts is that the "validity of these objections is usually based on clinical experience." It occurs to me that many operators do not get results on account of poor technic.

F. D. Saner, in the *London Lancet*, in April, 1920, in an article entitled "The Plating of Simple Fractures," enters a general discussion of its use. The length and thoroughness with which he treats this subject bespeaks his knowledge and appreciation of the value of the plate. He brings to notice two principles in the treatment of any fracture of a long bone: (a) restoration of the anatomical line, (b) preserving the function of the joints below and above the seat of fracture. Mr. Lane is quoted as saying that

"a restoration of the soft structures to their original position depends entirely upon the reduction of the bone; and the movements of the joints are often hindered by misplacement of the muscles at the seat of fracture. Also, the body weight, in the long bones of the lower limb, may place a strain upon the seat of a faulty position which ultimately affects the joints."

In the *British Journal of Surgery*, 1918, the same writer discusses both the closed and open method of treatment of fractures of the long bones. I quote a paragraph:

"I believe if the soft structures are destroyed sufficiently to allow the effects of tension a complete reduction of the fragments may be obtained by non-operative measures. The effusion of blood into closed fascial compartments with little or no destruction of the soft parts offers an almost solid resistance, and renders immediate or even eventual reduction extremely difficult; and in cases where the displacement is severe, almost impossible. Therefore in such cases that demand operative treatment the method of choice is that of plating as evolved by Sir Arthbuthnot Lane,

and I am advocating this method for the treatment of simple fractures."

This article lays stress upon the necessity of a free incision, both for the purpose of using a long plate easily, and also more properly to control oozing which may continue afterward and increase the liability of bacterial invasion. It is good practice to leave hemostats *in situ* as long as possible, so that many small bleeding points may not have to be tied;

"for the absolute sterility of the suture material is uncertain, and tying necessitates a definite risk of touching the field with the fingers."

The cut edges of the muscle should have a few intermediate sutures of cat gut to assist in the arrest of bleeding. It is highly important that the plate fit the bone snugly in order not to place undue strain on certain screws, which will loosen them and necessitate the removal of the plate. Another principle of importance is that the gauge of the drill should be finer than that of the screw and the hand drill allows the operator to determine better the density of the bone.

Saner claims to have pictures of plates *in situ* for seven years and more, which show no evidence of rarefication of the bone about the screws. When there is perfect apposition of the fragments, very little callous is thrown out. Skiagrams are deceiving as to the progress of union. If weight bearing is allowed too early, there is a great tendency to undue strain on the plate with resulting loosening of the screws.

Swett, in the *Journal of Orthopedic Surgery*, 1919, reports twenty-eight cases of plating of long bones, including femur, tibia and fibula, radius and ulna. In these twenty-eight cases sepsis was encountered in two instances, but cleared after removing the plate. There were no cases of vicious or non-union, but one case of low-grade osteomyelitis which was relieved on removal of the plate. This writer feels that results in this report were far better than could have been obtained by any other method.

Time does not permit discussion of the after treatment, but a Thomas leg or arm splint offers the method of choice for rest of the limb.

Compound fractures present a problem wholly different from that of simple fractures, but there are cases in this type which are best treated by plating.

ADVANTAGES OF THE BONE PLATE

(1) Gives perfect coaptation.

(2) More nearly produces complete immobility at the seat of fracture.

(3) Allows more strain at the point of union than other splints.

(4) May operate perfectly without the aid of external splints.

(5) Has the advantage of quick application and slight trauma.

(6) Less bulky than many internal splints.

(7) It is more trustworthy in a septic field than other forms of splints.

(8) Its long life and low cost deserve consideration.

(9) It is not necessarily taboo in a septic field.

FACTORS GOVERNING ITS PROPER USE

(1) A frequent mistake is using a plate too short.

(2) There is less trauma if we apply it on top of the periosteum instead of beneath it.

(3) There is more danger of infection in the very young and very old, due to lowered resistance.

(4) The plate should rest well against the bone in a snug fashion and be free from motion.

(5) There must be strict instrumental technic instead of finger.

(6) We do not advise routine removal of the plate.

(7) The plate should not be used in patients having wasting diseases.

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DISCUSSION

Dr. Frank K. Boland, Atlanta, Ga.—I cannot agree in the use of the Lane plate. I used the Lane plate ten or twelve years ago when it was first advocated, used it for two or three years

and then abandoned it and have not used it since. I believe we can get away from the use of metallic substances in the bone. They act as a foreign body and infection is very frequent, as we know. It is very difficult to keep them in place, as they easily become loosened, causing irritation and infection, and we frequently have to remove them. I know of cases where they are still in after several years' time, but in my experience are less successful. Theoretically, of course, the idea is good. Many fractures cannot be properly reduced except by an open operation. I believe, however, if we can get reduction that gives us function that is useful, we should stay away from the open operation, and most fractures can be taken care of by reduction by a man who gives proper thought and care to the treatment of the case. There are some, of course, that have to have the open operation, but they should be undertaken by the man who has an aseptic conscience and the operation should be carried out with the most careful technic; for we know the seriousness and chronicity of bone infection. Many cases have the interposition of muscle and other tissue between the fragments, and it is impossible to get perfect coaptation of the fragments except by seeing them and knowing they are placed together. In those cases open operation is indicated. In several instances I have operated upon fractures of the femur and I believe it is in the femur that open operation is most frequently indicated. I have found in half a dozen cases in the last eighteen months that I was able to operate and dove-tail the fragments together so that the pointed end of one fragment was held in the groove in the end of the other fragment, and then by the use of kangaroo tendon running in two directions the fragments were held in fair position and by the use of plaster of Paris splints I got fine results in those cases. The use of an absorbable material like that is better, if it can be used at all, than the use of any metallic substance. However, if a man can get the results Dr. Ralls has reported he should stick to that treatment. There are several methods of obtaining good results and each of us should stick to the method that has proven successful in his hands.

Dr. Isidore Cohn, New Orleans, La.—My impression from a certain amount of experience with fractures is that we should learn two things: first, better diagnosis, not devoting our time so much to better technic. Second, better diagnosis on the part of the men who see the cases first will permit an earlier reduction of the deformity. Deformity in the majority of instances can be reduced by conservative principles when applied along anatomic lines.

It is important that we understand certain physical principles along with our knowledge of anatomy and apply the two for the benefit of the patient. An equilibrium of forces is what we have in the harmonious action which permits of the co-ordination of our muscles. Without that proper equilibrium of forces it does not matter what kind of traction you apply, you will not have a return of function. An absolute anatomic restoration is necessary for good function and that can be attained if one will remember that there are certain groups of muscles which are attached to each fragment. The fragment over which we have no control is pulled in a direction over which we cannot have any control at all. To produce an anatomic restoration we must put the fragment over which we have control into the axis of the fragment over which we have no control. This can be done by conservative means. In our work at the Touro Infirmary in New Orleans and in the teaching at Tulane, some of us have been carrying out our teaching along those lines and have not been forced to put in nails, wires, or any other type of hardware, as Dr. Eve calls it. Compound fractures are treated as nearly as possible as simple fractures, by debridement and putting properly applied traction where it belongs. If we look at pictures of cases at Bellevue Hospital sixty years ago we find that traction and suspension were in use then, so it is not so new after all.

We hear a great deal about internal fixation. Now, there are many good traction tables, such as the McKenna, the Hawley and the Albee adaptation of one of these. Properly applied with the use of the proper x-ray machine, reduction can be accomplished. This will enable us to apply the principles of massage and passive motion, and we will get just as good results as with any type of internal fixation. Up to the present we have not had to use Lane plates.

I am sorry to disagree with Dr. Ralls on another point. I notice that he has been putting in screws and nails in the joints of very young children. I believe that trauma around the epiphyses is dangerous and that it should be avoided. If there is any one place where we should avoid internal fixation it is in the joints of very young children.

Dr. James K. Simpson, Jacksonville, Fla.—I heartily second what Dr. Cohn said about the use of plates and nails around the joints of young children. To plate the supracondylar joints of children is very dangerous. I have had excellent results by reducing under the fluoroscope and putting the joint up in the Jones position. I do not see any use in opening the elbow joint of the young child. The x-ray has made us a little hypercritical in some ways. The bones sometimes do not look well in the x-ray, but if the child has a good functioning arm it does not matter how the x-ray picture looks. In only a very small percentage of cases is it necessary to do an open operation upon these fractures. In some cases where you cannot get good reduction under the fluoroscope it is justifiable to open, do the reduction, and then put the arm in position without the use of any foreign material at all. I am not in favor of putting in any foreign material whatever.

Dr. W. B. Burns, Memphis, Tenn.—The Lane plate should be used in the compound fracture, with the prospect of removing it.

I have been having much more trouble with fractures since I have been x-raying all my cases. They look bad in the x-ray plates. We should not use these foreign bodies as long as there is ossification and that continues.

Dr. Boland spoke of using little bands to oppose muscle action. I had one case in which I used a simple method with very good results. It was a case of compound fracture of the femur, where a flying piece of steel went through the muscles of the thigh and broke the femur straight across. Under the fluoroscope I was trying to get the fragments in position and get them to stay. I found that by a little manipulation and slight pressure I could get proper alignment. Just a little pressure on the outer side would hold it, so I put a heavy four-inch bandage next to the skin and let it come flush with the distal end of the upper fragment and made traction gently on the bandage at right angle to the bone and incorporated the bandage in my cast still held taut. I got perfect alignment and no shortening.

Dr. Ralls (closing).—I did not mean that we should plate every case of elbow fracture, but I believe everyone will agree that we get fractures about the condyle in which the Jones position and other positions will not give the result we wish. I have seen many cases where the results were not satisfactory.

In regard to absorbable material, I went into a large instrument house recently and asked for decalcified bone plates. They told me they did not carry them and had never had a call for them. This shows how seldom men are using decalcified plates. I then asked if they sold many Lane plates, and the reply was, "A great many." No doubt some operators attempt to do fracture work without operative measures; but there are cases in which operative procedures are necessary to obtain the best results.

INTESTINAL RUPTURE FROM EXTERNAL TRAUMA WITHOUT EXTRA - ABDOMINAL EVIDENCE: REPORT OF TWO CASES*

By Charles A. Vance,
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An important fact which is apparently often ignored by the average practitioner of medicine is that intestinal rupture may occur from externally applied trauma without the production of sufficient surface evidence to suggest serious visceral damage. The cases to be described of patients seen within a period of about thirty hours will emphasize the necessity for earlier surgical intervention, irrespective of accompanying local or general symptoms, where the abdomen has been subjected to external trauma.

Every medical man is probably familiar with the ancient and pernicious text book dictum that one should await the appearance of symptoms definitely indicating visceral injury following abdominal contusions before resorting to surgical intervention. Curtis thirty years ago collected 116 examples of intestinal rupture from abdominal contusions. Not a single patient was subjected to operation; and the mortality was 100 per cent. Notwithstanding the disastrous result in each instance, the author concluded his article by stating the following principles:

(1) That the treatment of abdominal contusions should be purely expectant in the early stages, until symptoms of internal injury have appeared, or until the full extent of the time in which they may be expected has passed. Exploratory celiotomy at this time is inadmissible.

(2) That when the symptoms of uncontrollable hemorrhage or serious visceral injury appear, celiotomy is indicated; but when the diagnosis is uncertain, the operation should always be begun as an exploration.

(3) That great collapse is an absolute contraindication to all operative intervention.

(4) That when rupture of the intestine is found, the best method of treatment is to secure the injured gut to the abdominal wound and form an artificial anus. This can be easily relieved by a later operation when the patient has received his strength (Curtis).

In advising colostostomy this distinguished author evidently overlooked the important fact that in a considerable proportion of instances intestinal ruptures are multiple and not single following extra-abdominal trauma.

About fifteen years after the publication of Curtis' paper, Gage (1902) collected 85 additional cases in which intestinal rupture followed abdominal contusion. Of these patients 45 were not operated upon and died, and of 40 subjected to celiotomy, 17 recovered. Of 29 operated upon within twenty-four hours, 13 recovered. Of 4 subjected to operation within forty-eight hours, 2 recovered. One, op-

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erated upon the fourth day after the injury, recovered. In one the time elapsing between accident and operation was not stated. Of the 45 patients who were permitted to perish without operation, 18 survived less than twenty-four hours. Four operative cases were recorded by Gage, 1 being successful and 3 fatal.

Petry's statistics (1906) covered 160 cases of intestinal rupture treated without operation, the mortality being 93 per cent. In a later series (Siegel) of 376 cases, the mortality was 51.6 per cent following operative intervention. In operation within the first four hours after injury the mortality was 15.2 per cent; five to eight hours, 44.4 per cent; nine to twelve hours, 70 per cent.

The statistics presented by Sherk (1911) embrace 293 instances of visceral injury from extra-abdominal violence, the causative agencies being as follows: explosion, 1; strain, 4; blows, 86; kicks, 51; "run over," 38; falls, 53; "thrown," 15; crushed, 42; and not stated, 3. The intestines were injured 181 times; the liver, 22; the spleen, 45; the pancreas, 25; the omentum or mesentery, 14; the diaphragm, 5; and an ovarian cyst, 1. Preoperative or ante-mortem diagnosis was made in only 101 of the 293 cases. Of these 101 diagnoses, 28 were general; 17, probable; 38, accurate; and 18, wrong. Of the 18 incorrect diagnoses, most were wrong as to the nature of location of the injury, not as to the fact. In 9 cases it was frankly stated that no diagnosis was made; while in 183 the diagnosis was not even mentioned. Stated in percentages, the figures are: no diagnosis, 65.5 per cent; wrong, 6.1 per cent; probable or general, 15.4 per cent; accurate or correct, 13 per cent. One hundred and thirty-two patients died; 155 recovered; and the result was not stated in 6. Of the 293 patients, 257 were subjected to operation and 36 were not operated upon. Of the latter, all died. Of the 256 operated upon, 96 died and 155 recovered. The result in the 6 was not stated. The following table, taken from Sherk's article, shows the length of time which elapsed between injury and operation in the 257 cases:

Operation following inury:	Total Cases	Died	Recovered	Result Not Stated
Within first six hours	64	15	48	1
Second six hours	36	12	24	..
Third six hours	29	14	13	2
Over eighteen hours	78	35	42	1
Indefinite (presumably early)	13	7	6	..
Time not stated	37	13	22	2

In intestinal injuries the mortality in patients operated upon within the first six hours was 20 per cent; the second six hours, 35 per cent; third six hours, 56 per cent; and over eighteen hours, 66 per cent.

While no definite conclusions can be reached concerning frequency of the various symptoms, Sherk states that the following figures have reference to manifestations observed during the first few hours after injury. In the records of 265 cases, pain was mentioned 182 times; as decided in 147, slight in 29, and absent in 6. It was not mentioned in 83 cases. Shock was mentioned 94 times; severe in 46, mild in 31, absent in 17, and not mentioned in 171 cases. Rigidity was mentioned 159 times; marked in 125, slight in 20, and absent in 14. (In about half the latter it appeared as a later manifestation.) It was not mentioned in 106 cases. Peristalsis was mentioned in only five instances; absent three times and present twice. In the two latter cases operation disclosed no trauma.

Mature study of the foregoing statistics, says Sherk, shows that the mortality of injuries to the intra-abdominal viscera from external violence (more than 40 per cent) is much higher than of corresponding lesions resulting from causes, and is due no doubt to lack of early diagnosis and to operative hesitance. The death rate of early operations averages less than one-third that of late operations. The more commonly observed symptoms — pain, shock and rigidity — were present early in a large majority of the cases; pain in 97 per cent; shock in 82 per cent; and rigidity in 90 per cent. Peristalsis

was noticed or mentioned in less than 2 per cent.

The conclusions of Sherk are so admirably stated that they are reproduced practically verbatim, and the writer desires to express entire agreement with them:

(1) That anyone who has been subjected to external violence of such nature as could, either directly or indirectly, produce injury to any of the abdominal viscera, should be given the most careful examination and be kept under close observation for several days.

(2) That any symptom, no matter how slight, referable to the abdomen must be considered as a sign of possible visceral injury when it follows the receipt of any violence, regardless of the point of impact or the extent of the external force.

(3) That the degree of violence bears no relationship to the extent or severity of the resulting injury.

(4) That a most thorough investigation as to the exact details of the accident is important as an aid in determining the possibility and the nature of the injury.

(5) That blows, kicks, and crushing violence produce the majority of intestinal injuries. Compressive force is the most common cause of trauma of the liver, and concussion is responsible for the greater number of splenic ruptures.

(6) That the presence or absence of peristalsis is of the utmost importance from a diagnostic or prognostic standpoint. Its early presence indicates that the abdomen or its contents have received some shock or violence, and the persistence or recurrence of this sign is conclusive proof of internal or visceral injury. A decided lessening of peristalsis is a danger signal if it occurs more than three or four hours after the accident. Active peristalsis is always encouraging in the presence of any abdominal injury.

(7) That there are no pathognomonic symptoms, most of them being common to all injuries; but, in general, progressively increasing shock indicates trauma of the solid organs, while early symptoms of peritonitis follow tears of the stomach and intestine.

(8) That pain as an initial symptom is important only in that it calls attention to the fact that an injury may have occurred, and that it may by its location indicate the possible site of the trauma.

(9) That shock possesses no real diagnostic value except as to its progress or course, which is of the utmost importance.

(10) That an exact diagnosis is unnecessary, though it is highly desirable, and the early recognition of the probability of visceral injury is absolutely essential to lower the death rate in these cases.

(11) That the "appreciation of possibilities," or, as Murphy has aptly expressed it, "a keen surgical sense," is what is needed by the doctor who first sees the patient.

"It is noteworthy that the clinical symptom-complex depicted in surgical text books is almost never observed in actual practice, and to delay operative intervention following external abdominal trauma awaiting the so-called 'classical picture' usually means addition to the long list of another preventable fatality. The statement requires no emphasis that carefully executed exploratory celiotomy according to the modern technic of aseptic surgical procedure, in a well-equipped hospital where trained assistants are available, is practically void of clinical risk, and following external abdominal trauma of any magnitude the dictum 'the greatest good to the largest number' should be the surgeon's invariable guide. . . . To procrastinate is merely to court disaster; therefore, prompt exploration with repair of visceral damage, provided such has occurred, represents an ideal 'safety first' measure which the conscientious surgeon can no longer afford to ignore. . . . . Certainly, a life-saving exploration is preferable to almost inevitable fatality under expectant treatment, provided there exist even presumptive evidence that visceral damage has occurred."

CASE REPORTS

Case I.—A. P., a male, aged 43, at 8:20 a. m., May 30, 1921, was struck on the left abdomen by the end of a post which fell against him with considerable force. His physician, who saw him within two hours, did not regard the injury as serious and merely administered a sedative. He saw the patient again during the afternoon of the same day, but as his condition still did not seem serious, operative measures were not advised.

During the night the patient began suffering abdominal pain and vomited several times. When seen by his physician the morning of May 31, more than twenty-four hours after the accident, it was realized that the man was in a desperate condition. I was hastily summoned and operated upon him at 2:30 p. m., thirty hours after infliction of the injury.

The abdomen was opened by a mid-line incision and beginning peritonitis was noted. There was a rupture of the ileum about two inches in length, which was sutured; and after evacuating as much of the fluid and feces as possible the abdomen was closed, a drain being inserted in each flank and another in the *cul de sac.*

The patient stood the operative procedure very well and looked no worse afterward than before. However, his condition did not improve and the next day it was evident that he could not survive. Peritonitis quickly became general and death occurred two days later.

Case II.—J. B., a male, aged 26, was kicked in the abdomen by a horse July 28, 1921, at 5 p. m. He was seen at 7 o'clock by a physician who, after examination, stated that there was nothing the matter with him, that he would get all right without any trouble, and administered a sedative. The same physician saw the patient again the next morning and dismissed him, saying that there was no further need for his services.

Within a few hours the man began to suffer abdominal pain, became nauseated, and vomiting began in the early morning and persisted all that day. He suffered so intensely that another physician was called about 5 o'clock, or twenty-four hours after the injury. This physician realized after making an examination that a serious abdominal injury had occurred and sent for me. After making a hasty examination, I placed the patient in my automobile and drove twenty miles to the Good Samaritan Hospital, Lexington, Ky., where he was operated upon at 11 o'clock that night, July 29, thirty hours after the accident.

A mid-line abdominal incision disclosed a rupture of the ileum from which the intestinal contents were pouring. This was sutured and after evacuating as much of the fluid and feces as possible the abdomen was closed with drains in both flanks and the *cul de sac*. He recovered very quickly from the effects of the operation. Saline proctoclysis was given and the patient was placed in the Fowler position. Large quantities of fluid escaped through the drainage tubes. The drains were removed in four days, after which the wound closed except for the drainage openings.

The patient continued very ill with fever and increased pulse rate for two weeks, during which time the abdominal muscles were very rigid. The drainage became fecal in character and remained so for four weeks. As the fluid from the peritoneal cavity lessened the wound was strapped with adhesive plaster and gradually closed. It was so well united at the end of eight weeks that the patient was allowed to walk about. He left the hospital October 8 and reported to my office for observation once a week for the next month. The wound was then entirely healed, and while there was no sign of hernia, he was advised to wear an abdominal binder for some time.

I saw this man in September, 1922, and he still had no hernia, but the abdominal wall seemed rather thin. He is working as a farm laborer and says he has gained forty pounds in weight since he left the hospital.

It is interesting to note that he was with the American Expeditionary Forces for twenty-two months, that he went "over the top" three times without being wounded, and then came home to be kicked by a horse and almost killed.

It is fair to state, in justice to the physicians who failed to make an early diagnosis of visceral damage in these two cases, that there was no evidence of external trauma, and the development of indicative symptoms of internal injury was delayed several hours. When the patients came under my observation, more than twenty-four hours after infliction of the injury, the clinical manifestations were classical and unmistakable, but the delay in diagnosis had rendered surgical intervention extremely hazardous.

Fort has recently published an excellent contribution to this subject and the following resume is abstracted from his paper:

> The increasing frequency with which preventable fatalities are observed from injury to intra-abdominal viscera accompanying external trauma without the production of positively indicative local or general symptoms should cause every conscientious practitioner of medicine to indulge in serious introspective study and reflection: the medical man, because he oftentimes first sees the injured individual and much depends upon the promptness and thoroughness of his investigation and his diagnostic and prognostic acumen; the surgeon, because upon his diagnostic confirmation, his technical ability and "keen surgical sense" will usually depend the life (or death) of the individual.

It is important that an accurate history of the accident be obtained in every instance where external abdominal trauma has been inflicted; the nature of the traumatizing agent, the attitude of the individual when injured, the exact anatomic region implicated, the probable force and direction of the violence, and the time with relation to food ingestion.

The data thus collected should be carefully considered in connection with existing local and general symptoms, if any be present, in estimating the possibility of coincident internal injury. The pertinent fact must not be forgotten, however, that extensive visceral damage may be produced by apparently slight external trauma; also, that there may be no coincident internal damage despite violent external injury.

There being no pathognomonic early signs by which visceral injury may be certainly recognized, early accurate diagnosis is often delayed or rendered impossible. This fact, however, is unimportant since it is the imperative duty of the surgeon to intervene provided there exist even presumptive evidence of internal damage. Procrastination more often than otherwise means a fatal issue, and properly executed celiotomy is practically void of clinical risk. Where visceral damage has occurred the mortality under expectant treatment is nearly one hundred per cent.

Promptly instituted surgical intervention, based upon "suspicion" or "presumption" of internal injury after exhausting

reasonable efforts to complete an accurate diagnosis, with adequate repair of visceral damage when such has occurred, should markedly reduce the unreasonably high mortality prevailing in the class of cases under discussion. The dictum that the earlier operative treatment is instituted where visceral injury has occurred, the greater the probability of saving the life of the individual, should be accorded more consideration than has hitherto obtained.

In closing, the writer desires to thank the authors cited in the appended list for the privilege of excerpting and restating their statistical data:

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DISCUSSION

Dr. George A. Hendon, Louisville, Ky.—The importance of this subject is proclaimed both by the large number of cases that occur and the very high rate of mortality that attends the condition. In a rather hurried investigation of the literature we found about 936 cases reported in the last three years. A very interesting feature in connection with these accidents is the fact that one-third of all the cases recorded are the result of kicks by horses.

Another feature of this investigation has somewhat of a mathematical color. We can almost invariably apply the rule to all the cases that the mortality of the operated cases can be obtained by taking the number of hours that elapsed from the time of the injury to the time of operation and multiplying by three. When there is no delay the mortality is 78 per cent in the operated cases.

Of course the delay is easy to account for. It can be accounted for by the fact that the symptoms in the beginning are misleading on account of their mild nature, and the reason for the mildness of the symptoms is found in the phenomenon reported by Nicholas Senn, in which he pointed out the fact that an injured intestine would contract for several inches above and below the injury and in that way prevent the rent from being a point of leakage. Then the violent symptoms came on after muscular exhaustion had supervened and relaxation of the intestine allowed the contents to flow out into the abdomen.

Another cause of unnecessary delay is the fact that all the articles that are written in text books and current literature give a group of symptoms, and when one studies a group of symptoms one involuntarily and unconsciously gains the impression that the entire group must be present before one can arrive at a diagnosis. That is a very serious and very fatal mistake. One author states in italics that no single symptom is pathognomonic. I think we should select one single symptom and be willing to abide by it. If I had my choice it would be progressive advance in the pulse rate. The next choice would be pain persisting over a period of six hours. The next cause for delay is very often the apparently trivial injury that will result in rupture of the intestine. We find one case reported in which a boy fell down with a golf ball in his pocket and the pressure of the ball produced a rupture of the intestine. So it is well to apply the addage that we have long applied in injuries of the head, that there is no such thing as a trivial injury to the abdomen. Perhaps in that way we shall avoid the unnecessary delay.

Another thing is the amount of force that brings about a rupture of the intestine. It seems that the authors are uniform in their opinion that the intestine is torn by the force of the blow, pressing the bowel against the spinal column or in some instances against the ileum, and in some instances the rupture is doubtless brought about in that way.

The site of the injury is interesting. The site of location, or preference, is the duodenojejunal junction. The next point is in the duodenum; the third, in the large intestine; and the fourth, in the ileum, perhaps on account of its greater degree of mobility.

In operating upon these cases drainage should assume a very prominent place in the treatment. Every case should include a suprapubic stab with drainage in the *cul de sac*. We should never attempt to drain the retrovesical fossa to either side of the median line because the distance is too great. Much better results in the drainage are obtained by shortening the distance as much as we can.

Vomiting is not so important a symptom as it is in intestinal obstruction. It is not nearly so constant, and should not be waited for.

A final point is that shock is of rather low degree when we would expect it to be of rather high degree. The shock is much greater when there is injury of the spleen or liver or the kidney than when there is rupture of the intestine.

Dr. W. A. Bryan, Nashville, Tenn.—If you cut a man open and there is no rupture, how are you going to explain it? If you do not cut him open and there is a rupture, how do you explain that? The difficulty of settling the question is illustrated by the following two cases. One patient was struck by a heavy stick that is used to put the belt from the fly-wheel off from an idler. He was bruised a little, but there was no sign of other injury. Later he had a bowel movement and his temperature continued normal. Some other doctors saw him and said that he was all right. He was hurt on a Thursday and I saw him on Friday night. The following Thursday he had acute abdominal symptoms. We operated upon him, found the ileum was ruptured and he died.

The other patient was driving a small truck and ran into a large truck. The steering wheel struck him in the abdomen. Immediately he came in with a rigid abdomen, claiming to have vomited blood and to be suffering with great pain. We told him frankly that the symptoms looked like a ruptured viscus; we did not know positively, but that if we waited until we could be certain it would be too late to save him. I said I would have the abdomen opened. We opened it and he had nothing at all. The man went down town when he recovered and consulted a lawyer, who said there was nothing to do. If there is a question about an internal injury I want witnesses who know they are witnesses to stand by me. I want to say before them, "Mr. Jones, you are apparently hurt internally. We are not sure whether you have a ruptured intestine or not, but if you have and we wait it will be too late to save you. If we open the abdomen and you are not hurt you have taken a small risk, and I think that is the thing to do." We need those witnesses and we want to know where they are; for as surely as we open these cases we are going to find some fellows who will resort to law and try to make us trouble.

Dr. Duncan Eve, Nashville, Tenn.—I saw in consultation recently a patient who had been kicked on the abdomen by a mule, but who had no objective symptoms whatever, no rigidity, no localized pain, and not even nausea. The physician took the position that he should make an exploratory incision, but I insisted upon some more definite symptoms. The next morning the patient was well and left the hospital.

Dr. James T. Leeper, Lenoir City, Tenn.—Last summer I saw early in the morning a negro who had been kicked by another negro at a baseball game late the previous afternoon. When I arrived I found him in what I considered a serious condition. He was in shock; the pulse was rapid; and there were evidences that justified a diagnosis of ruptured intestine. I called the hospital at Knoxville and arranged for an emergency operation. I gave the man a hypodermic of morphin about 10 o'clock in the morning. He was hurt about 4 o'clock the afternoon before. When we started for the hospital about 2 o'clock in the afternoon he had another hypodermic and reached there in such excellent condition that the interne, who was a very capable young fellow, suggested that he might not be hurt so badly as I thought. I looked the man over again and thought possibly the Doctor was right. The man might not have anything more than a traumatized abdomen. Feeling that we would be justified in waiting, we did so. One of Knoxville's best surgeons was called and he agreed with me that we would be justified. The next morning the man was in perfectly good condition. The next day passed uneventfully except for a sore abdomen, but on the third day the interne called me and said the man was going bad. He had a hernia and it had pouched out and the abdomen had begun to become distended. I told them to get ready and I would come over for an emergency operation. On opening the abdomen we found a rupture of the ileum that had become "glued" to another fold, and after relaxation peristalsis began. In the meantime we had found it necessary to give one more hypodermic of morphin to make him comfortable, but had not encouraged any movement of the bowels. When the peristalsis began leakage occurred. We repaired the ring in the intestines, put in free drainage, and after a somewhat stormy convalescence he recovered.

Dr. J. M. Clack, Rockwood, Tenn.—I agree with Dr. Bryan. About six days ago I had a patient with a blow on the stomach. There was shock and hematemesis. I gave her a hypodermic of morphin, which did not relieve her. I waited an hour and gave another hypodermic without relief. I said to her: "I do not know whether or not you have a ruptured stomach, but if you are willing I will open you up and see." I opened her abdomen in three-quarters of an hour from that time and found no rupture of anything. I heard from the patient today, and she is doing well. She was sensible enough to take the chance.

PROSTATECTOMY*

By Montague L. Boyd, M.D.,
Atlanta, Ga.

I have had the peculiar experience of having been educated almost entirely in the use of the perineal method of prostatectomy, and having been gradually led to the use of the suprapubic method in most of my cases.

In nearly all cases, the best method for the surgeon to adopt depends upon the urological facilities and assistants which he has for doing his work. There are certain types of prostatic obstruction, usually the small, the very fibrous, and the malignant prostates, which cannot be removed satisfactorily by the suprapubic route. They should always be removed perineally. On the other hand, all cases of prostatectomy can be done satisfactorily by the perineal route except the rare subcervical or subtrigonal gland enlargements. The great majority of cases can be operated upon by either method.

The surgeons lacking facilities for pre- and post-operative care of these patients are usually forced into the use of the two-

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stage suprapubic prostatectomy, because of the experience and skill necessary for the proper preparation of cases for operation by catheter drainage. A properly adjusted suprapubic drainage tube needs little attention from any one, while intermittent or continuous catheter drainage requires constant attention from internes or orderlies. And that attention demands an experience, skill and patience not possessed by the average interne and rarely acquired by orderlies or nurses.

After leaving Baltimore, where my training was almost exclusively in the perineal method with preliminary catheter drainage, I adhered for some time to that operation despite all difficulties. At length, however, I concluded that to get the best results for my patients I had to have a method which was in the pre- and post-operative handling as nearly accident-proof as possible, and I believe that the two-stage suprapubic operation comes nearer fulfilling that requirement than any other. The first stage of the operation gives the patient a continuous or, if desired, an intermittent drainage and a freedom from the pain or discomfort which is often caused by the catheter. It does not keep him in bed much, if any, more than catheterization, and should it happen that the drainage becomes obstructed, permits him to get relief himself, if no other assistance is at hand, by pulling the tube out of the wound.

Furthermore, after the removal of the prostate we have in this operation a method of controlling hemorrhage almost immediately which any interne, no matter how slight his experience, can use, and also a freedom of bladder drainage which does not require constant attention immediately after operation.

The post-operative attention necessary for patients after the perineal operation is perhaps little more than that required for suprapubic cases. But when performed by unskilled hands (and even occasionally in skilled hands) there may be a hemorrhage which demands opening the wound under anesthesia and repacking or tying off the bleeding point.

The first stage operation in the two-stage suprapubic prostatectomy is no more necessary than catheter drainage in the perineal cases, where there is only a small amount of residual urine and little impairment in kidney function. The reasons offered by some for doing a first stage in these cases is that there is less shock to the patient when the enucleation is done, and less chance for troublesome infections of the wound after the space of Retzius has been walled off by the healing of the first-made wound. In selected cases, however, where there is very little residual urine, evidence of only slight impairment from the prostatic obstruction, and where the patient's general condition is good, the best results are obtained by doing the whole operation at one time.

There are some points concerning the two-stage suprapubic operation which may be of advantage to mention. The use of the mushroom catheter and silver wire stay sutures has greatly simplified the preliminary suprapubic cystotomy. The bladder is closed snugly around the mushroom catheter and then sutured to the recti muscles. Two or three large size silver stay sutures are passed from within outward through the muscles, fascia and skin. A small tube and a piece of rubber protective are left in the lower part of the wound to drain the prevesical space. With this strongly closed wound nearly all the patients can be gotten upon the commode and out of bed in a chair as soon after operation as is desired, and it is the general opinion that the sooner this can be done the better.

Besides allowing the wound to heal more rapidly and avoiding the discomfort of wet dressings, I find that the freedom from leakage obtained by using the mushroom or button catheter makes it possible for some of the patients who require long preliminary treatment to leave the hospital and come to my office for attention. I consider this a matter of no little importance, for many patients who can get up and about improve much more rapidly out of the hospital.

After enucleation of the prostate, much time is often wasted in getting the freed lobes out of the bladder. The best method for avoiding this is not by having some special instrument for grasping the lobes,

but by having the suprapubic wound large enough to work through easily. The size of the opening needed will depend upon the size of the hypertrophy, the shape of the operator's hand, and the thickness of the abdominal wall. At a one-stage suprapubic prostatectomy a large wound can be easily obtained by cutting through the skin and fascia as is wished and then stripping back the peritoneum from the bladder to the point desired. At the second operation, however, in the two-stage method it is not so easy to have the wound so large as desired unless preparation has been made for this at the first stage, for the bladder should then have become attached to the recti muscles laterally, and above the peritoneum will lie transversely across the wound, limiting its extension. If the opening is too short it will be found that the bladder will split upward from the force employed in enucleating and delivering the prostate and the peritoneum very likely will be torn.

The essential points to be observed in the first operation are somewhat as follows: expose the bladder and distend it to about 16 ounces (500 c. c.) or to its already measured capacity if less in size than normal. Strip the peritoneum well off the ventral surface, freeing it enough laterally to avoid pulling the fold down against the upper part of the wound (where the catheter should be left) when the bladder is empty. An opening can then be made and the catheter fastened in high upon the ventral wall of the bladder and the bladder sutured to the recti muscles in such a manner as to leave ample space between the symphysis pubis and the point where the catheter is fixed. In fixing the bladder in this manner it is well to remember that the wound will be contaminated in most cases where the bladder is infected. In some cases it is possible partially to fix the bladder to the recti muscles before opening it and thus avoid soiling the outer parts of the wound. But in all cases a free passage between the wound and the lateral areas from which the peritoneum has been stripped should be left for the purpose of drainage in case infection should develop. This can be done best perhaps by not fixing the bladder to the recti muscles in the lowest part of the wound, draining the prevesical space with a tube and letting the patient sit up very shortly after operation.

There is an inclination to suture the first stage wound too tightly. It is hardly necessary to emphasize the importance of preparing free drainage for the prevesical space, though in reading Dr. Paul Pilcher's article on prostatectomy in Cabot's "Urology" of 1918, Vol. I, p. 616, I am left with the impression that he makes no provision for its drainage. To insure this I use a small tube drain and close the lower part of the wound very loosely. The same free drainage must exist for the wound about the catheter to provide for a probable leakage of urine. Only the bladder mucosa should fit snugly about the catheter, the muscularis less closely, the recti muscles still more loosely and so on out to the skin.

A careful examination of the contour of the prostate before enucleation is often helpful. With the rectal and intravesical fingers the extent of the hypertrophy should be outlined, noting especially the intravesical limits, so that none of the hypertrophied tissue will be left behind. This will help to prevent the doubt that sometimes arises as to whether or not all of the hypertrophied part of the gland has been removed, especially at the point where it was stripped away from the trigone.

There are only two points of importance concerning the drainage of the bladder after enucleation: first, the drainage must be absolutely free; and, secondly, the tube must not protrude into the bladder far enough to cause discomfort. Either one of these things if neglected may cause a continuance or a recurrence of the hemorrhage following the operation, besides giving the patient a good deal of discomfort.

A large open drainage tube (I prefer one about $\frac{7}{8}$ inch in diameter) should be left in the wound and if a home-made one is used the intravesical end should be fenestrated and the edges of the end and the fenestration burned and then wiped with gauze moistened with gasoline. This makes them smooth and soft. The tube should be quite short to prevent its being pushed too far into the bladder or an-

chored very firmly to the edges of the wound. Whenever the tube is removed to withdraw the Hagner bag, the same or a smaller tube should replace the one removed. In one of my cases when the Hagner bag was taken out of the bladder the morning after the operation no tube was left in the wound. In about six hours the lips of the wound had sealed together so tightly that about ten ounces of urine were passed through the urethra at one time without breaking them apart. Fortunately, no bad result followed this accident, but the distention of the bladder with urine at that time might well have produced some extravasation about the wound followed by an unpleasant infection in the tissues, or a breaking away of the newly formed clots and the occurrence of further hemorrhage.

Tubes which push too far into the bladder cause a desire to urinate which may be accompanied by spasmodic contraction of the muscles of the bladder, thus starting up the bleeding again and making the patient extremely uncomfortable, often in spite of morphin.

The patient frequently can be kept dry with the mushroom catheter after this operation as well as after the first-stage operation. Here, however, a large catheter with a large head is at first used (30 F.), the size being reduced by changing for a smaller catheter as the wound heals, until a 12 or 14 F. size is reached, when the wound can probably be made to heal after leaking part of the urine for only a few days. It is very necessary to keep a close watch to prevent a possible obstruction to the drainage tubing during the first seven days, and I do not recommend the employment of this method unless a competent nurse is in attendance night and day.

In one case where I used this drainage the patient was at times irrational. One night, five or six days after operation, he decided that a night nurse was too much of a luxury and discharged her. She was unwise enough to leave him without notifying me and as a result of his being unwatched he rolled over upon the tubing while he was asleep, over-distended his bladder and almost bled to death. A Hagner bag, pulled into place by a catheter passed through the urethra and out of the wound, and a blood transfusion, undoubtedly saved his life.

Many methods are used to control the post-operative hemorrhage after suprapubic prostatectomy, but nearly all are unnecessarily tedious and ineffective. So far I have found the Hagner or Pilcher bag quite satisfactory. The bag should be distended with a measured quantity of water (measured for accuracy in redistention by the interne if necessary) before the wound is closed, and its size made to suit the extent of the wound against which it is to be pulled. Sometimes it must be made quite large to enable it to press against the fringe of torn tissue at the trigone. After about one hour the tension upon the tube which runs through the penis is released. The fluid is then (the sequence is important) allowed to escape from the bag, which remains in the bladder for six to twenty-four hours as the comfort of the patient may demand and caution dictate.

There are certain complications following prostatectomy for the prevention of which I do not believe we are doing enough, namely, seminal vesiculitis and epididymitis. These arise largely from an extension of an infection from the posterior urethra rather than directly from an injury to the prostatic urethra and ejaculatory ducts. Free bladder drainage does not always mean free drainage of the prostatic urethra, for in those cases where the internal sphincter rapidly regains its tone the cavity left in the place of the posterior urethra is pretty well closed. An attempt to prevent the infection of this area should be made by passing a catheter through the urethra and gently irrigating through it. If a colored solution is used it is easy to tell whether the fluid flows freely into the bladder through the internal sphincter. If it does not, only very small quantities of irrigating fluid should be run in to irrigate the posterior urethra and a bladder irrigation should be done separately by running a catheter through the suprapubic opening. I have been using instillations of acriflavine and mercurochrome into the posterior urethra and bladder through the catheter without any apparent harm and with, I hope, some benefit. It is important that hexamethylenamin be begun immediately after operation. If it cannot be taken by mouth, it should be given by rectum in about six ounces of water every

four hours. If the urine is alkaline, lactic acid bacilli should be planted in the bladder.

When despite these measures a seminal vesiculitis and epididymitis develop, I believe in emptying the vesicules by gentle massage, avoiding any roughness which might break up existing thrombi in the veins about the wound.

In one case some years ago, a patient had a stormy convalescence with obscure symptoms, the cause of which was not discovered for some long time. He had a pelvis of remarkable depth and my fear of using too much force in making a rectal examination caused me to overlook the seat of the trouble. As soon as a vesiculitis was discovered and massage of the vesicles was begun, he rapidly improved.

This and other instances have led me to believe that the vesicles are not infrequently the cause of intermittent or continued fevers after prostatectomies, and of some of the long-standing and annoying post-operative urethral and bladder infections which do not respond to the ordinary methods of treatment. I have found no clearly defined mention of this point in the literature.

SUMMARY

Every surgeon, urological or general, who does not have good facilities for rendering an efficient service by the use of catheters to cases requiring urinary drainage as a preparation for prostatectomy should employ the two-stage suprapubic prostatectomy method. It is the best way to prevent those mishaps which sometimes occur to patients during the preliminary or post-operative treatment, due frequently to ignorance or carelessness of internes, nurses or orderlies.

The Hagner bag or its Pilcher modification offers an efficient method of control of post-operative hemorrhage, and may be reapplied as long as the suprapubic wound is well open.

Concerning the suprapubic operation there are a few points worthy of attention. At the first stage it is advantageous to use the mushroom or button catheter with silver wire stay sutures. Room must be left between the symphysis pubis and the point at which the catheter is fastened to allow a large incision at the second stage. Drainage must be arranged for in case of leakage of urine about the catheter or the development of infection lateral to the sutures which hold the bladder to the recti muscles. The drainage of the prevesical space helps to prevent complications.

At the second stage it is advantageous to outline the limits of hypertrophy before enucleation. The use of a large drainage tube prevents distention of the bladder with urine, but pushing it into the bladder more than one-third of an inch should be avoided. For four or five days or longer the wound should have some kind of drainage tube in it to prevent its lips from adhering. The patient can often be kept dry while most of the wound is healing if mushroom catheters are used and the size of the tube is gradually decreased. Great care must be used during the first week to prevent blocking of the drainage and a resulting over-distention of the bladder.

Every precaution should be employed to prevent infection of the urethral pouch from which the prostate has been removed, since the infection may spread to the seminal vesicles, vasa deferlia and epididymes. In vesiculitis, the vesicles should be emptied by the gentlest effective pressure, avoiding any force which might disturb thrombi in the periprostatic vessels. This is not a method to be employed by those who lack an educated forefinger.

Discussion follows paper of Dr. Livermore, page 391.

SOME DISPUTED POINTS IN SUPRAPUBIC PROSTATECTOMY*

By George R. Livermore, M.D., F.A.C.S., Memphis, Tenn.

The different methods employed in carrying out the many details prior to, during, and following suprapubic prostatectomy is my excuse for this paper.

In the preparation for operation the most important consideration is drainage. Shall it be by retention catheter or by suprapubic cystotomy? We all know that in the cases with infected bladders with a small or moderate amount of residual

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urine, it makes little difference how we drain. The results are equally good. But in the cases with over-distended, non-infected bladders we have a very difficult task before us. At the last meeting of this Association Dr. John Caulk, in the discussion, made the statement that it makes very little difference whether we empty the bladder suddenly or gradually. I wish to take issue with him, for the sudden relief of back pressure produced by suddenly emptying the bladder causes congestion of the kidney with resulting tendency to suppression of urine and uremia. This can be clearly proven in even the cases with a small amount of residual urine, for if we do a suprapubic cystotomy (without previously gradually reducing the residual) and promptly empty the bladder, a patient who prior to the cystotomy had had no casts in his urine will show them in twenty-four to thirty-six hours following it, and there will be a marked diminution of his twenty-four-hour urinary output and an increase in his blood urea and creatinin.

This establishes beyond doubt the risk that is run (particularly in cases with markedly diminished kidney function) every time we suddenly empty the bladder of a prostatic. The safety of our patients demands the gradual withdrawal of residual urine, especially in those who have a low 'phthalein output or a high urea and creatinin content.

The two-step operation should be done in every case. If it makes an inoperable risk an operable one, it makes a good risk a better one. It puts the bladder at rest, relieves the back pressure on the kidneys and fortifies the patient against infection. Should the patient die following the first step of the two-stage operation it does not bring prostatectomy into disrepute, because the family and friends know it was done simply in the hope of getting the patient into condition to undergo the removal of the prostate. I feel sure he would have died under catheter drainage. We all lose some of these cases whether we drain by catheter or by suprapubic cystotomy.

Some patients tolerate a retention catheter very well, while others cannot or will not retain it at all. Suprapubic drainage solves the difficulty, for the tube can be put snugly in the bladder, held with a purse string suture, and the bladder can be emptied as gradually or as suddenly as we desire.

Many surgeons enucleate the prostate and make no effort or provision for the control of hemorrhage. As these patients are all old men, common sense demands the conservation of every ounce of blood they possess. Whether the hemorrhage is controlled by ligation, suture, gauze plug, Pilcher or Hagner bag, never let a patient leave the table until it is checked and provision made to keep it checked. I prefer the Pilcher bag because it is easily and quickly adjusted, controls the hemorrhage perfectly and supplies a splint for the denuded prostatic urethra.

In Montreal two years ago, I saw a surgeon do a suprapubic prostatectomy. After the gland had been enucleated, he turned to the visiting surgeons and drew their attention to the fact that as there was so little bleeding he did not consider it worth while to make any attempt to control it. By night the patient had lost so much blood that it was necessary to put in packing to check the hemorrhage and he was so exsanguinated that transfusion was done to save his life. It is this type of case that proves the necessity of instituting measures that insure control of hemorrhage at the time of operation.

I have seen contracture of the neck of the bladder follow where the retention catheter was used and also where it was not used. However, for a few days it is of benefit and materially aids in the reformation of the prostatic urethra, and if followed by the passage of a sound in a week or ten days, contracture of the neck of the bladder will be a rare occurrence. The Pilcher bag solves the problem of the control of hemorrhage and also supplies a retention catheter to which the bag is attached.

A large suprapubic tube, after the second-step operation, promotes free drainage, which lessens the possibility of tenesmus and hemorrhage by putting the bladder at rest. A small tube easily becomes plugged by a blood clot and with no tube

at all tension on the recti muscles closes the wound so completely that we get the same result, or even a worse one, than when a small tube is used. The large tube is removed in forty-eight hours and the Pilcher bag should come out at the same time. A smaller suprapubic tube is then inserted for another day or two, when it, too, can be removed. Should there be a tendency to hemorrhage, the replacement of the suprapubic tube will suffice to check it.

In most cases cystoscopy is a perfectly harmless procedure, but in those with poor kidney function it is an extremely dangerous undertaking. Therefore, I never cystoscope until I am satisfied that the patient's kidneys are able to withstand the effects of the shock, urethral chill and fever that may follow. I had a sad experience before adopting the above rule.

I saw a man who was extremely uremic and somewhat septic from pyelonephritis due to back pressure from an enlarged prostate. There were only three ounces of residual urine. Under gradual catheter drainage he steadily improved and in a week's time I thought it safe to cystoscope him. This was done, and a moderately enlarged prostate and a trabeculated bladder were seen. He seemed in good condition on leaving the cystoscopic room, but in a few hours went into profound shock, from which he never rallied.

I have never employed spinal anesthesia, having had such perfect success with gas oxygen that I see no reason to make a change. The one great disadvantage of spinal anesthesia (other than its danger) is that the patient is conscious of every step, and is therefore nervous and wrought up. Should some complication arise, it cannot be met with the same degree of equanimity as if the patient were asleep. With nitrous oxid and oxygen anesthesia preceded by synergistic analgesia with novocain and adrenalin injected in the line of incision, under the capsule and into the prostate, we have a method that practically eliminates shock and leaves little room for improvement.

The 'phthalein test is of the greatest value, but should be used only in conjunction with the examination of the blood for urea and creatinin and should not be relied upon alone. In some persons, 'phthalein acts as a diuretic and even 60 to 75 per cent may be excreted in two hours, when the kidneys are so badly damaged that it would be unsafe to operate. I prefer to have all tests within normal limits before removing the prostate, but if the blood urea and creatinin are within safe limits, I feel safe even though the 'phthalein output is low.

DISCUSSION

Papers of Dr. Boyd and Dr. Livermore

Dr. H. W. E. Walther, New Orleans, La.—It is generally admitted that it is not necessary to do all prostatectomies in two stages. The principle is correct in the majority of cases, but in many instances where the patient is in good shape we should not be too dogmatic and certainly a prostatectomy is better in one stage than in two.

Dr. Livermore said that we should use a large tube for drainage following removal of the prostate. I formerly used the Freyer tube and usually removed it in 24 hours when I removed the Hagner bag. I am now following a plan which I think was introduced by Bugbee, of using no tube but a gauze wick. Many men have talked about keeping the patient dry after prostatectomy but I have never seen one who could be kept dry. No matter what kind of a tube is used, from the simple suction to the most elaborate electric apparatus, they do not work and the patients get wet just the same. I have instituted the wick drain, with large gauze fluffs, to be changed as necessary, for three or four days, then I remove that and use a small pezzer catheter.

Dr. Hamilton W. McKay, Charlotte, N. C.—Carrying the over-distended bladder through the transitional stage to where the bladder is empty is a very delicate task for any surgeon. If a catheter is introduced into an over-distended bladder, we produce a sudden decompression, and the thing that is most likely to follow is hemorrhage, possibly suppression and uremia, with possible death.

We are all inclined when we see prostatics with a large amount of residual urine to do something. We may or may not decide to cystoscope. These cases should not be cystoscoped until we know that the functional capacity of the kidney is good and that the patient is accustomed to instrumentation.

Dr. Abraham Nelken, New Orleans, La.—I have been doing urology now for over twenty years and sudden emptying of the bladder has been constantly referred to in text books and the danger emphasized. That is on a parity with something else in the books which I have never seen, namely, spasmodic stricture of the urethra. It has been my practice to empty bladders completely and I once had occasion to remove seventy ounces of residual urine. The risk referred to in the text books is "hemorrhage ex vacuo" bleeding, being due to sudden release of pressure on the bladder veins. I have never yet had oc-

casion to regret this complete emptying of an over-distended bladder. If there is danger of uremia I have escaped it up to the present.

As to hemorrhage following prostatectomy, those of us who are familiar with the history of prostatectomy know that men like Freyer and Fuller paid no attention to the risk of hemorrhage following removal of the prostate. The operation was done without any attempt at packing of the prostatic cavity, and it is remarkable how little reference is made to post-operative hemorrhage. However, we all recognize that a large wound such as is left by the removal of the prostate should not be allowed to remain without checking the bleeding. It is an unsurgical procedure.

Many things have been done to control the bleeding. Some men have gone so far as to ligate every bleeding vessel. The packing with gauze has given way largely to the use of rubber bags. My only case of fatal hemorrhage was one where I had removed a gauze pack in forty-eight hours, leaving the patient apparently well. Bleeding began shortly after and before I could be reached he had bled so profusely that he died within a few hours. The recent case was one where there was complete retention of urine, due to a senile prostate which had existed for many years. The patient had been leading a catheter life. We removed a small stone back of the bladder before removing the prostate. The removal of the prostate left a very large cavity and the Pilcher bag did not control the bleeding. Because it was too small I packed around the edges of the wound. As this patient had had a history of bleeding for many years, I was unusually careful. In six days we released the water in the bag, still leaving it in place. The next day he had a hemorrhage. I pulled the bag a little further out and again filled it with water. The interne called me up the next morning to say that the patient thought he was bleeding, but he (the interne) thought he was probably nervous. I hurried down to the hospital and found the patient almost exsanguinated. With the Pilcher bag still in place and still distended, the man had almost bled to death.

I mention these cases to show that my trouble with hemorrhage has only begun since I have been making an effort to control it.

Dr. Jerome L. Morgan, Memphis, Tenn.—The more I see of infected bladders following the obstructive prostates, the more I realize that we should lay more stress on the preparation of these cases for prostatectomy. We cannot use too much time in getting the patient prepared for the prostatectomy and we have not completed our work by doing a suprapubic drain, because most of these bladders—if they are not infected when we open them—become infected within the next two or three days. We should have the bladders irrigated every day and see that they are draining perfectly. Even with a large tube in the bladder we cannot keep them clean without irrigating every day with some sterile solution. The mucus and pus that is accumulating in the bladder because of some bacterial infection must be eliminated before we can expect to institute the proper drainage and get the kidney into proper condition, which we are supposed to do. It is up to us to irrigate the bladder and see that the kidneys are functioning properly before we do the final stage of the operation.

I agree with Dr. Livermore that a markedly distended bladder should not be emptied immediately, but gradually. That can be done by putting in a drainage tube with a purse string suture. We can make it dry round the wound and control the amount of urine we want to let out each time. I have seen cases have uremia or anuria following immediate emptying of the bladder. Those who have not had them will have them if they continue to empty such bladders at one sitting.

We cannot lay too much stress on getting the patient into condition for the operation. We can probably all remove the prostate, but that is the least part of our work. The men who have the most success in prostatectomies are the ones who lay special stress on the preliminary treatment.

Dr. Paul Gelpi, New Orleans, La.—Only in exceptional cases have I been troubled with hemorrhage following prostatectomy. The guide I use is a simple one. I wash out the bladder with very hot solution and in those cases where the fluid becomes faintly tinged with blood I feel safe. If there is quite a marked tinge, I decide to pack. I insert an umbrella catheter in the urethra, have it press down over the point of enucleation and then pack gauze under and around it and let it come out through the suprapubic wound. I find there is usually enough space to allow drainage below without wetting the patient too much.

I have used spinal anesthesia for over eighteen years in my urologic work. I have successfully used cocain, stovain, tropococain, alypin, and since the war I have been using apothesin. In prostatic work particularly I have been very happy in my results. We have verified time and again that there is no shock. The patient's pulse after operation is the same as before operation. The analgesia is perfect, and even in the fibrous cases that are rather difficult of enucleation it is sufficient to allow us to complete the operation without hurry. In only one case have I ever had serious trouble, and I have had no fatality. When we first used spinal anesthesia with cocain, annoying symptoms arose and were usually due to the fact that the patient's head was allowed to go too far down on the table and the cocain rapidly reached the medulla. In the case referred to, the pulse went to pieces, as did the respiration, the patient was in bad shape and it was only by prompt stimulation and getting him back into the upright position that we were able to save him. But I was still able to remove the prostate and the patient is in fine condition at the age of sixty-six.

Dr. Arthur L. Chute, Boston, Mass.—From Dr. Boyd's paper, do I understand that at the second

operation you enlarge the suprapubic incision? I try to avoid this by using a sufficiently large suprapubic tube at the time of the cystotomy so that the opening can be dilated at the time of the second operation to a degree great enough to allow whatever intravesical maneuvers are necessary. I believe it is an advantage not to open up the abdominal planes a second time.

Dr. Boyd spoke of puddling in the posterior urethra. Oftentimes this is the result of leaving a diaphragm or a high threshold at the bladder outlet, the result, I believe, in part, of the stress that the Baltimore school has put upon the danger of cutting the internal sphincter. If, after you enuclate the prostate, you find a diaphragm at the outlet, it is important to cut it. In such instances I pick up this fold of tissues, which is like an "apron" dam, between two long straight clamps and then cut between them. The flap I sometimes pack down lightly against the raw surface of the cavity from which the prostate had been removed. This maneuver I believe important in preventing certain contracted bladder outlets that I have seen following prostatectomies. I have always felt that the internal sphincter was of little value and could be practically disregarded in suprapubic operations. In perineal operations when one may weaken the external sphincter, either by incision or scarring, the preservation of the internal sphincter becomes an important matter.

The method to employ in the pre-operative emptying of the over-distended bladder always interests me. For the most part I employ the immediate incision under novocain, but whenever I go to a meeting where the pre-operative use of a catheter is enthusiastically advocated, I go home convinced that I have found a panacea and that I am now going to be able to get all my patients well. But I find that while, for the most part, it works well, as does suprapubic incision, there is still the same small percentage of people who fade away. It is my conclusion that there is a small percentage of people that we cannot save, no matter whether we open their bladders suprapubically or drain them by catheter.

I cannot agree with the routine irrigation of the bladder after operation. You want to know just how much urine the kidneys are getting out and irrigation makes this difficult to measure. A considerable diminution in the output of urine may be the first indication of serious renal involvement. It is important that this be recognized early that it may be properly combated by the use of salt solution.

I am sure that there are cases in which we will cause spinal anesthesia trouble, but the trouble is such as to worry the operators rather than to endanger the patient. If spinal anesthesia were used more in prostatectomy, we should not have so much talk about post-operative hemorrhage. It lowers the pressure materially and favors clotting. A few days ago we took the blood pressure of a patient on whom I was enucleating a prostate, and we found it to be 70/45. Sometimes it goes even lower. This man was doing well in every way and no one would have guessed that he had so low a blood pressure. It simply illustrates the way in which the blood pressure goes down and clotting is favored. Another advantage of spinal anesthesia is that after the injection one has an hour and a half in which there is no increased anesthetic risk, and one may use this time in controlling any hemorrhage there may be by temporary packing. If one does this he will rarely have occasion to use the Pilcher bag or any other hemostatic device. The bleeding has ceased before you put in a suprapubic tube.

Dr. J. Shelton Horsley, Richmond, Va.—Hemorrhage, shock and infection are an important trinity following operation, and they have a marked relation to each other. Early hemorrhage and early shock can be cured by transfusion if it is given soon enough. Infection frequently follows as the result of either of these complications. Hemorrhage elsewhere in the body is controlled first by applying pressure, as when we ligate or clamp a vessel, and the second point is packing. For instance, if a uterus were bleeding, we would pack with gauze, not with rubber. If there was a bleeding wound in the muscular part of the thigh, we would pack with gauze. Gauze does two things: first, it exercises a certain amount of pressure; and, second, it promotes clotting. Clotting depends upon the presence of fibrin ferment in which another substance from tissue cells called prothrombin or thrombokinase is essential. Gauze is rough and promotes clotting by producing prothrombin or thrombokinase from injured blood and tissue cells. Rubber is smooth and does not promote clotting. Rubber bags and other material of that sort depend chiefly upon pressure. It is like controlling hemorrhage in the leg; a tourniquet is most valuable at first, but it is dangerous if it is left on too long. If you leave a Hagner bag in place for seven or eight hours and it presses upon the tissues it acts as a tourniquet and may produce local necrosis, whereas the packing with gauze depends not solely upon pressure.

Transfusion should be looked forward to in every case. We rarely do a prostatectomy without having two or three donors matched up beforehand. Then if the blood pressure goes down we use a transfusion by the direct method, never citrate. If an old man gets a chill it will work much harm, probably more than a transfusion will do good. We have never had a bad reaction following a direct transfusion.

Dr. Boyd, Atlanta (closing).—About keeping the patients dry with the mushroom catheters, Dr. Walther is right that some of them cannot be kept dry by any means, but where a very large mushroom catheter is used, with a large head, it is often possible to keep most of the urine flowing through the tube. Even if you can get rid of only a great part of the fluid, patients are kept more comfortable, especially those who are nervous.

Dr. Nelken said he pulled the Pilcher or Hagner bag down and then distended it. That is the wrong way to apply it. It should be well distended and then pulled down. If it is well distended and the fringes of torn tissues are pressed back under the bag, they can nearly always be kept in place, even in large wounds, and the hemorrhage controlled. The blood is not entirely pushed away from the surface of the tissues by the bag and a good deal of blood can accumulate between the bag and the tissues where it clots.

The comparison of the tourniquet and the pressure produced by the Hagner bag does not seem to me to be a suitable one. With the tourniquet you compress all the vessels by pressure from the outside against a bone on the inside and are thus able to stop the flow of blood from the bone to the surface, while with the bag the pressure is largely superficial and diminishes as it extends downward into the tissues. You do not get a necrosis unless you put on great pressure and leave it in for a long time. It is seldom necessary to leave it in long.

I have inserted the bag in patients who were bleeding profusely and strapped it down to the leg while the bladder was still open and I could thus observe the bleeding immediately stop. If you try this you will be convinced that it is easy to control the hemorrhage. Of course you will occasionally get a secondary hemorrhage, but if you allow the bag to collapse after you release the pull on the urethral tube the bladder will contract and you will rarely have bleeding.

Dr. Chute's point about the internal sphincter is very interesting. As he says, I was brought up in the perineal school where we were taught that the internal sphincter must be preserved whenever possible. Often when the prostate is taken out you can feel the internal sphincter contract across the vesical orifice and almost shut off the urethra from the bladder, and I have no doubt that in suprapubic prostatectomy cutting this sphincter would do away with a good deal of the post-operative trouble and would have no bad effect at all.

Dr. Livermore (*closing*).—I have seen patients brought in from the country who had had complete retention of urine and some ambitious doctor had catheterized and completely emptied the bladder, die of uremia. I have also seen patients have severe hemorrhages due to rupture of veins on the floor of the bladder following the sudden release of pressure by the sudden withdrawal of the residual urine.

I use a purse string stitch tied snugly around the tube and by clamping the tube empty the bladder as slowly or as quickly as I desire.

I use a chromic gut suture in the fascia and do not put in a drain in the suprapubic space, unless the patient is large and fat or unless a cavity is there. It is usually unnecessary to keep this space open, but in a large, fat man where necrosis is likely to occur with infection it is important to put in drainage.

The control of hemorrhage is most important. Many prostatics who are said to die from uremia and shock really die from hemorrhage because no attempt was made to control the hemorrhage. The blood pressure was lowered with consequent failure of kidney function and he dies from uremia because he lost so much blood, or he may die from what we call "shock" which would not have occurred if he had not bled so freely.

EYE, EAR, NOSE AND THROAT

ACUTE OTITIS MEDIA IN CHILDREN*

By Joseph B. Greene, M.D.,
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Acute inflammation of the middle ear in children is one of the most frequent, and likewise the most serious, conditions the specialist in our branch of medicine is called upon to treat. The condition is serious not only for the reason that its complications endanger life, but also from the fact that the valuable sense of hearing may be impaired or entirely lost. The middle ear and the adjacent tissues, particularly the eustachian tube, in infancy and childhood have certain anatomical differences from those of the adult which have a distinct bearing upon the course of the disease, so that it seems desirable to direct your attention briefly to these structural peculiarities.

In the first place, the eustachian tube in a young child is short and relatively large. Its direction from the naso-pharyngeal orifice is almost horizontal, differing in this respect from that of the adult, which has an oblique course upward. It is also thought that the tube in a child is more patulous. It can be readily seen with what ease micro-organisms gain entrance to the middle ear from infections of the upper respiratory tract. The drum membrane in a child is more horizontal, and is thought to be thicker than that of the adult. The difference in thickness, and also the shorter and more open tube which affords at times partial drainage of the middle ear, would explain the occasional delay in the spontaneous rupture of the drum membrane in children. The middle ear in the young is said to contain remnants of embryonic tissue, a factor which lowers its resistance to infection.

It is well to bear in mind the possible presence of a defect or dehiscence in the petro-squamosal suture situated in the tegmen tympani. The absence of bony structure at times in this region makes easy the occasional early extension of infection from the middle ear to the cranial cavity, causing meningitis. The antrum is present at birth and is of considerable size, though situated on a much higher level than in the adult. The outer wall of the antrum is thin and the bone is of soft structure, which explains the frequent development of the sub-periosteal abscess in this region. The mastoid cells are not a factor to be considered until about the end of the second year of childhood. The antrum, however, which is merely an extension of the middle ear, may require opening and drainage.

It cannot be questioned that the presence of adenoids and diseased tonsils are causative factors in producing acute inflammation of the middle ear in children. This lymphoid tissue acts harmfully, not only in harboring infection, but in preventing ventilation and drainage of the middle ear. I cannot agree with a well-known aurist who regards large adenoids as a protection to infection of the middle ear by closing the mouth of the eustachian tube. Children who have been successfully rid of their tonsils and adenoids are less liable to middle ear inflammation. Children are also susceptible to the acute infectious diseases, particularly scarlet fever, measles and diphtheria, which makes them liable to attacks of acute otitis media. Acute rhinitis, or what is often termed cold in the head, is a frequent cause of middle ear inflammation. Acute intestinal diseases, so often encountered in the spring and summer, are frequently complicated with middle ear disease. Anemic and undernourished children have a lowered resistance to the invading organisms.

The nasal douche in the hands of the inexperienced can easily drive infection into the middle ear. It is only in exceptional cases that its use is justified. The swimming pool is another fruitful source of middle ear infections and will continue as a causative factor as the popularity of water sports increases, for the possibility of keeping a common swimming pool sanitary has not yet been attained.

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The organisms concerned in acute otitis media are varied, and frequently there is a mixed infection. Though the course of the disease and the severity of the attack cannot be accurately determined from the type of organism present, yet we are accustomed to anticipate a rather severe attack in the presence of streptococci and pneumococci. This is particularly the case when the middle ear inflammation is associated with measles or scarlet fever. There are cases, however, where the patient's resistance is low, that the less virulent organisms, as the staphylococci, may set up a very severe inflammatory condition. So we cannot with certainty predict the course of the middle ear disease from the type of the invading organism.

It is unfortunate that the classification of the acute middle ear diseases is a bit hazy. There does not seem to be, for instance, in the early stages, a clinical distinction between acute catarrhal otitis media and the acute suppurative form of the disease. Of course when the discharge is distinctly purulent, the differentiation becomes plain enough. I am of the opinion that the purulent type of the disease in the early stages is usually of the simple or catarrhal form. Kerrison in his excellent work makes his classification from the anatomical situation of the inflammation. If the exudate is located in the atrium alone, he calls it catarrhal, or simple; if in the vault, as well as the atrium, he designates it purulent otitis media. For me, it has been frequently difficult from otoscopic findings to determine with accuracy the site of the exudate. In discussing the symptoms and treatment of this condition, I shall not attempt to distinguish sharply the two types of the disease, except to say that an attack which sets in with mild symptoms, particularly with reference to temperature, we are likely to regard as a simple or catarrhal type. When the symptoms are more severe, and the discharge soon becomes purulent, we call it suppurative otitis media.

A case may begin as a catarrhal type and later assume a suppurative form. There is usually present a triple symptom complex: temperature, pain and defective hearing. In infants and young children, the hearing function cannot be readily determined, and the evidence of pain is not always elicited. Previous to the fourth month in infancy the motor response to sensations being hardly developed, we seldom have movements of the hand to the affected ear as we have in later months of infancy and childhood. Temperature then becomes by far the most important symptom of the disease and very rarely is it absent. The temperature is of the continuous type and the afternoon rise may be as high as 104 or 105 degrees. The pulse rate is greatly increased. Extreme restlessness as evidenced by rolling and tossing in bed is a symptom of considerable value. Convulsions may occur, due not only to the general toxemia, but to the close relationship between the middle ear and the brain cavity.

It is in infants that the appearance of the drum membrane assumes the greatest importance. In the early stage of the disease there is only slight redness of the drum membrane, particularly evident in the region of the long process of the malleus, or possibly confined to Shrapnell's membrane. In a later stage of the disease we observe marked redness and swelling of the tympanic membrane, with obliterations of the landmarks. A more advanced stage of the inflammatory condition is evidenced by bulging, particularly in the postero-superior quadrant, though it may be in other portions of the membrane. Vesicles are at times seen, especially in inflammatory conditions associated with influenza.

From what has been said, it would hardly seem necessary to repeat that in the young the otoscopic findings are of first importance. In certain cases, the differential diagnosis between acute middle ear disease and furunculosis of the canal offers some difficulties. A very slight rise of temperature, or its entire absence, would speak in favor of furunculosis. There is usually marked pain and tenderness on moving the cartilage of the ear. Inspection of the ear canal should reveal some swelling. In older children it will be noted that the hearing function is not disturbed, the test being made while the canal wall is held open with a speculum. However, we may have suppurative otitis media complicated with furunculosis of the

canal wall, a very difficult condition to confront us.

The most frequent complication of acute otitis media is mastoiditis, which in infancy till the end of the second year of life means a necrosis of the antral wall. On account of the slight bony protection of the brain cavity, meningitis is a fairly frequent complication. Sinus thrombosis may occur, evidenced by great exacerbation of temperature, and often there is positive blood culture. Distinct chills, so frequently observed in older children and adults, are a less frequent symptom in the very young. Acute inflammation of the labyrinth may be present though, fortunately, this is not a frequent complication. On account of the slight protection of the facial nerve in the bony canal, there may be paralysis of the facial muscles; usually, however, this is of short duration. Extra dural abscesses and brain abscesses may complicate a suppurative otitis media, though they are rare in the acute stage of illness.

As preventive medicine is so much the order of the day, we as otologists have a special duty we owe our patients and the public to teach how best to prevent middle ear disease and its occasional resulting deafness. There is hardly a question that the presence of diseased tonsils and adenoids plays a very important role in the cause of the condition. The acute infectious diseases, particularly scarlet fever, measles and diphtheria, run a milder course, and the ear complications are less frequent when the tonsils and adenoids have been successfully removed. The writer on one occasion removed the adenoids of a child who had been freshly exposed to measles, with the hope of lessening the danger of the complicating middle ear disease. This child whose adenoids were removed came down with measles at the expected time and went through the course of the disease without the slightest symptom of middle ear involvement. In my opinion this preventive measure should be more frequently considered under such circumstances.

Children suffering from head colds, particularly if fever be present, should be put to bed and the nose given appropriate treatment. They should be taught not to blow their noses too violently, and then closing only one nostril at a time. The possible danger of the nasal douche, which has previously been referred to, should be taught our patients and its use permitted only in exceptional instances. The swimming pool in our large cities is becoming a greater menace, and certainly those who are susceptible to middle ear disease should abstain from swimming. It is very important that children with a perforated ear drum, though it be entirely dry, should stay out of the water. Children suffering from acute infectious diseases should have their mouths kept as clean and as aseptic as possible and the associated nasal condition should be given proper treatment. The ear drum should be examined daily as routine. For this we must rely upon the pediatrician and the general practitioner.

As to the treatment of acute otitis media, at the first appearance of symptoms our patients should be put to bed in a cool and well ventilated room, both extremes of temperature, if possible, being avoided. It is with some hesitation that I speak of such a well recognized form of treatment as purgation, for practically every writer whom I have consulted urges this as a first and essential consideration. In my opinion, it is the least important. Should the child by chance be constipated, a mild laxative, or what is often quicker and better, an enema, may be prescribed. You recall that up to a few years ago we were urged to use purgatives as a preparatory measure for operations under general anesthesia. We have learned that our patients do better without this needless medication. It would seem that we hold fast to traditions in medicine. Our patients should be given light and easily digested food and plenty of water to drink. It has seemed to me that the importance of drinking plenty of water has not been sufficiently emphasized.

On account of the close association of the middle ear and the eustachian tube through the nose and naso-pharynx, this region should receive treatment, with the idea of opening the nasal cavities and affording ventilation and possibly drainage of the tube and middle ear. For this purpose a few drops of a weak solution of

epinephrin to the nose may be prescribed, though I am in the habit of using drops of iodin, menthol and camphor, each one-half grain or a grain to the ounce of hydrocarbon oil. Ten to twenty per cent argyrol has been recommended. It has always seemed to me that the use of drops instilled in the nose is far preferable to an atomizer. For the earache in the early stage of the disease, warm carbolized glycerin dropped in the ear canal is very grateful. It has the added advantage of placing the drum and ear canal in a more aseptic condition in case paracentesis should later be required. For the pain and restlessness, small doses of paregoric or acetyl salicylic acid are often useful. Application of heat in the form of a hot water bag to the affected ear adds greatly to the comfort of the patient.

Should evidence of pain persist, particularly when associated with a rise of temperature, incision of the tympanic membrane should be seriously considered. The indications for paracentesis become positive when the symptoms of pain and high temperature are associated with a red and swollen drum membrane. We must bear in mind that there are cases of severe middle ear diseases where the drum membrane shows very slight changes, certainly not the bulging so often described, where a paracentesis is indicated. Then again symptoms of pain and temperature may be slight, particularly in undernourished children, and here we must rely upon the appearance of the drum membrane as our guide for operative interference.

To sum up the situation, in determining the necessity for making an incision in the tympanic membrane, we must take into consideration the symptoms with the clinical history, though our greatest reliance, particularly in very young children, must be placed upon the otoscopic findings. If possible, operation should be performed under general anesthesia, nitrous oxid being preferred. Ether, in my opinion, has the preference over chloroform. There are times when we must operate with a local anesthetic, and my preference in such cases is for the Politzer's mixture of cocain, menthol and phenol.

It seems quite important, before operating, to disinfect the drum membrane and ear canal. For this purpose I am in the habit of swabbing the canal with alcohol, which serves the additional purpose of removing epithelial scales and fragments of wax which interfere with a proper view of the drum membrane. The incision should of course be a long one, the point of election being in the posterior half, the incision extending from the floor to the superior wall. The operation is usually followed by a considerable flow of blood from the canal, which is soon succeeded by a serosanguinous discharge. In the suppurative form this discharge soon becomes purulent and may continue for several weeks, while in the simple form we may expect a cessation of the discharge within a few days.

In case a general anesthetic is administered for the paracentesis, the question of removing the adenoids at the same time is to be considered. I have practiced this on several occasions with uniformly satisfactory results. There would seem to be no objection to this procedure from a surgical standpoint. In fact, it has much to commend it. There might be offered some valid objections to the operation of tonsillectomy during the acute stage of otitis media, which would not apply to the simple operation of adenoid removal.

It is my custom immediately after an incision of the drum membrane to direct that the ear be irrigated every few hours with warm boric acid solution, drying the ear canal as well as possible after irrigation. This measure facilitates drainage, which is so important, and at the same time supplies heat, which is an aid to resolution. Kerrison strongly advises early irrigation after incision for the purpose of removing the clot, which tends to prevent the exit of discharge from the middle ear. The frequency of irrigation should diminish as the temperature falls and the discharge lessens. Should the discharge continue for several weeks in spite of all efforts, we should abandon the irrigation and advise frequent dry swabbing of the ear canal, taking care that all discharges be removed as far back as the drum membrane.

The dry treatment has many strong advocates and consists in placing a wick of sterile gauze carefully and loosely into the

ear canal, taking pains that it reach, if possible, the point of incision of the drum membrane. This method has never appealed to me, for the reason that one is never sure that it facilitates drainage, particularly when the discharge becomes thick and purulent. Then again removal of the wick and its insertion can only be accomplished by the aurist in attendance, except where the patient is in a hospital and under the care of a trained interne.

I should like to emphasize the following points brought out in this paper:

(1) The difference in the anatomy of the temporal bone and adjacent structures of infants and children from that of adults.

(2) Our duty in urging all measures possible for the prevention of middle ear disease and the importance of instituting prompt and appropriate treatment as soon as symptoms arise.

(3) The importance of early incision of the drum membrane without waiting for all the cardinal symptoms and the marked changes in the tympanic membrane, keeping in mind the fact that it is safer to operate a day too early than an hour too late.

305 Haywood Building

DISCUSSION

Dr. John H. Foster, Houston, Tex.—We are all familiar with the patency of the eustachian tubes in children which makes easy the entrance of infection from the nasopharynx. I have observed the expulsion of fluid from the middle ear by the act of mild coughing in a child. There can hardly be any question also as to the action of adenoids as a causative factor. I have been accustomed to say that recurrent attacks of purulent otitis media are diagnostic of adenoids, the removal of which is necessary to bring about a cessation of attacks.

I do not believe that the classification of acute otitis media into catarrhal and suppurative is correct. The conditions are rather different degrees of severity of the same process. This, in turn, varies according to the nature of the invading organism and the resistance of the patient, and also the thoroughness of the early drainage. True, pus is never found for two or three days after the onset of infection, and mild cases get well without the formation of pus at all.

The question of the diagnosis of this condition in infants sometimes is a fine point. In many cases the drum is not reddened and the position so nearly horizontal makes the question of the presence of fluid hard to determine.

On one point I am inclined to take issue with Dr. Greene. He says, "The most frequent complication of acute otitis media is mastoiditis." I am inclined to believe that subperiosteal abscess without mastoiditis is more common.

When a child with an acute otitis media develops a swelling behind the ear and the ear becomes pushed out, he is generally rushed to the hospital and an emergency mastoid done. If the ear condition has been going on for some time, he may have a mastoiditis with a perforation of the cortex with the formation of a subperiosteal abscess such as is seen in older patients. But he may not even then, and if the condition has developed within the first few days of the attack you may put it down as almost certain that the infection has spread up from the tympanic ring underneath the periosteum outside the mastoid. In many of these cases the pus can be expressed through the middle ear and at most only an incision down through the periosteum is all that is needed to effect a cure. In doubtful cases it is my custom to prepare to do a mastoid, make a free incision and inspect the bone. If no perforation of the cortex is present, I know the infection did not come through the bone. The wound may then be closed except for a drain and the patient will be well in a few days. Occasionally evidence of septic absorption is present without mastoid symptoms demonstrable by inspection, palpation or the use of the x-ray. In my cases the difficulty has been made greater by the fact that both ears were involved. In such cases the absorption has probably been directly through the jugular bulbs. All such cases cleared up, but I can assure you that they caused me a great deal of uneasiness.

In regard to treatment, I am an advocate of early incision. If in doubt, I incise. As a consequence, in the great majority of cases it is not necessary to see the case but once. They clear up rapidly.

We do have a class of cases, however, that taxes our wits to the utmost. Certain streptococcic cases tend to form an exudate that blocks drainage, while in others the swelling, or hyperplasia, of the tympanic mucous membrane interferes with drainage a great deal. In such cases the use of suction and alcohol drops is sometimes of advantage, while in others a mastoid operation is necessary to secure drainage and prompt healing.

Dr. Homer J. Dupuy, New Orleans, La.—I think Dr. Foster is mistaken in drawing the conclusion that in a case of post-aural abscess in which the cortex shows no solution of continuity between the inside and outside of the mastoid genuine mastoiditis, is absent. We see case after case of post-aural abscess without cortex dehiscence of any kind in which there is trouble within the mastoid cells. In a few instances invasion may occur from the middle ear along the posterior wall of the external meatus to the periosteum over the mastoid. This, however, I believe, is the exception.

Dr. Clifton M. Miller, Richmond, Va.—The cases that really puzzle the pediatrician as well as ourselves are not those showing with a red

drum and causing a restless child, but those cases with low-grade fever from 99.5 to 100.5° day after day, the child restless and fretful, with no definite symptoms. A large percentage of those cases that have adenoid infection will have middle ear trouble. I have opened a half dozen ears in the last three months, with three-hour cessation of temperature. There is no particular inflammation, but there is a bulging. They will clear up and get well in ten days by glycerin in the middle ear and treatment of the pharynx, and they will clear up in a shorter time by opening and getting serous drainage from the middle ear.

I agree with what Dr. Dupuy has said in regard to subperiosteal abscess. I have seen them where you push on the abscess and you push pus out of the external ear cavity.

For irrigation to clear up the pus I consider normal saline or bicarbonate of soda better than boric acid.

Dr. M. F. Arbuckle, St. Louis, Mo.—It is a serious question in my mind whether there is not in every case of acute otitis media of unusual duration, also an acute mastoiditis. I do not mean a mastoiditis that will have to be operated upon, but I believe there is an infection in most cases where it lasts, especially if there has been bulging. I am afraid I shall have to disagree with Dr. Foster about sub-periosteal abscess.

The question often asked me is, "What will happen to the hearing after the ear drum is opened?" I am a firm advocate of early incision, but that is the question that is put to me most often. I think that is one of the best ways of conserving the hearing that I know of. A thing that I have found very useful to control pain while opening ear drums, both in adults and children, is ethyl chlorid, inhaled.

For clearing up the infection of the nose, I have been using mercurochrome considerably, and I think it is very efficacious.

Dr. Jos. D. Heitger, Louisville, Ky.—Dr. Greene spoke of the variation in anatomy, but to me the most important point is the variation in the pneumatization of the temporal bone. If you go back over the old text books and anatomies you will find that the mastoid has been divided into three types: diploic, pneumatic, and mixed. Instead of there being three types, these are only phases of the pneumatization of the temporal bone. A careful study of Witmaack's work published several years ago will illustrate all this and clear up a great many things that have been bones of contention in our discussions in past years. The essayist mentioned the differentiation between the catarrhal and suppurative types. We have all seen these types; but to limit the catarrhal type to the cavum and the suppurative to the attic does not logically sound right. It is a meaningless explanation. Witmaack, in his work on the pneumatization of the temporal bone, considers the completely pneumatized mastoid as the only normal type of mastoid. The so-called diploic and mixed types belong to the category of delayed and incomplete pneumatization. A completely pneumatized mastoid is the one that gets well with blood-clot dressing, that gets well with the minimum of surgical interference, and it simply means that such a mastoid is easily drained, whether it is through the membrana tympani or through a post-auricular wound. I would certainly recommend this book to your attention. I have been told that Dr. F. N. Bigelow, of Providence, is translating it for the benefit of those who cannot read German. Witmaack goes so far as to state that any pathology appearing in the middle ear or mastoid is conditioned by the development that takes place in the first two years or so of the life of the individual. A careful study of this work will, I think, bring you to the same conclusions that I have reached, namely, that it does clear up a great many things which have been covered with meaningless blanket terms in the past.

Dr. Harold Bailey, Springfield, Mo.—A few months ago I saw a baby twenty months old, brought to me with an edematous, tender swelling behind the ear. The temperature had been 102 to 104° for a week. I advised opening the periosteum, thinking it was a subperiosteal abscess. The father consented, but the mother did not. Of course, the mother had her own way about it. I watched that child for three or four days, examining the drum every day, but there was no apparent pathology there. It had never had a running ear, no discharge or redness of the drum, no bulging and no clouding of the tympanic reflex. Finally, I noticed a little redness and bulging, and I took the child to the hospital and incised the drum, removed the adenoids and opened up the mastoid. I expected to find a subperiosteal abscess, but I found a mastoid full of pus that had ruptured through the cortex and caused a subperiosteal abscess to form. I mention this case because, to me, it was unique for a baby twenty months old to go through a middle ear infection, with mastoiditis, with a rupture through the cortex, without any apparent change in the ear drum.

Dr. Greene (closing).—With reference to the suggestion of Dr. Foster that a mastoiditis is not the most frequent complication of acute otitis media, I have been in the habit of considering subperiosteal abscess as a form of mastoiditis, whether or not it comes through the cortex of the antrum or superficially from the middle ear. It is a difference of terms rather than of fact when you consider the mode of infection as differentiating mastoiditis.

I am inclined to think that in all cases of periostitis of the mastoid it is safer to open the antrum for drainage, though the infection should come through the middle ear without perforating the outer wall of the antrum.

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DR. M. Y. DABNEY, Editor
C. P. LORANZ, Secretary-Manager

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Seventeenth Annual Meeting, Washington, D. C.
November 12-15, 1923

BASAL METABOLISM

In view of the increasing importance in clinical work of basal metabolism studies, it may be of interest to review briefly the development and simplification of these methods.

Immediately after the discovery of oxygen by Priestley, in the latter part of the Eighteenth Century, the renowned French chemist, Lavoisier, studied its uses extensively. He gave it its name, oxygen, which means "acid former," because from his experiments he wrongly concluded that it was necessary for the formation of acids. He also studied the nature of combustion and oxygen consumption in the human body. There is no existing record of the apparatus with which he worked; but he pointed out the relationship between the amount of oxygen consumed and carbon dioxid excreted by the body, and showed that this was dependent upon three factors: food, work, and temperature. The figures he obtained for oxygen consumption by the body under various conditions are strictly in accord with the knowledge of the present day. He laid the foundation for all the subsequent work in metabolism by Liebig, Voit, Rubner, etc., on down to our own modern school of Lusk, Benedict, DuBois, and many others.

THE RESPIRATORY QUOTIENT

Since Lavoisier, many different, very accurate and highly complicated forms of apparatus for determining the relation of excreted carbon dioxid to oxygen consumed by the body, have been used. It has been shown that the respiratory quotient, or $\frac{\text{vol. carbon dioxid excreted}}{\text{vol. oxygen consumed}}$, varies with the food consumed, and that if carbohydrates are consumed this ratio is unity. In the case of fats and proteins, it is less (0.7 and 0.8, respectively). That is, all the oxygen consumed is not excreted as carbon dioxid when fats and proteins are consumed.

The average caloric requirement of man per square meter of his surface area has been determined by Benedict, DuBois, and others on large numbers of normal individuals, and these average normal figures (0.82) are used now for comparison with the figures obtained from persons who are not normal. The basal metabolic rate of any individual is expressed as the percentage of his rate above or below the average normal figure.

METHOD OF DETERMINATION

One apparatus now in common use for determination of the metabolic rate is the Benedict oxygen consumption machine. It is comparatively simple, and sufficiently accurate to possess value. There are various other apparatus, such as the Tissot spirometer which is used in many hospitals. The procedure with the Benedict oxygen consumption apparatus, for example, is as follows:

After a fourteen-hour fast, while at rest, the patient's oxygen consumption rate per minute is determined by the machine. From this the number of calories

per hour is arrived at by multiplying by 60 and by 4.825. The last figure is the caloric value of one liter of oxygen at respiratory quotient of 0.82, which is the respiration quotient assumed in this type of work. The patient's body surface area is computed from DuBois' height-weight formula; and the figure for calories per hour is divided by this to reduce the reading to calories per square meter per hour. This figure is again compared with the average normal figure in the table of Aub and DuBois, which gives the average normal calories per square meter per hour for different ages and sexes. The patient's final reading is the percentage above or below this average normal.

It is thus seen that the basal metabolic rate is the amount of heat per hour, per square meter of body surface, that is produced during metabolism when the factors of food and exercise are practically negligible.

THYROID DISEASE AND THE METABOLIC RATE

In the human organism in hyperthyroidism the individual metabolic rate has been shown to be increased, and in hypothyroidism it is retarded. Comparison of the basal metabolic rate of an individual with the accepted average rate is then of considerable value in the study of thyroid disease.

All increase in metabolic rate does not mean hyperthyroidism and all decrease does not necessarily mean hypothyroidism. But more and more the value of this test in thyroid disease is coming to be recognized.

In diagnosis, it helps to rule out those syndromes resembling thyroid affections. In prognosis, it is an indication of the extent and severity of the condition. In treatment, it is an aid in determining what form should be employed, and by its fluctuations it will give an indication of the efficiency of measures used.

It has been truly said that the work of the seeker after knowledge will always find practical application. From Lavoisier's metabolism studies has come a test useful in the study of a frequently deranged ductless gland, of whose very existence he was not even aware.

OCCUPATION LICENSE TAX FOR PHYSICIANS

Only a few states in the Union continue to assess a license tax on physicians for the privilege of practicing their profession. It seems to be a difficult problem to make the legislators of these states realize that a great injustice is being done the profession by retaining on the statute books such antiquated laws. In some cities this license tax is assessed against the physician's gross income, and he is not permitted to deduct office rent or any of his running expenses.

The burden of caring for the indigent sick properly belongs to the state; but the physicians render thousands of dollars' worth of service to the poor without any financial remuneration whatever. This applies not only to organized institutions such as the various charity hospitals and free clinics whose staff members give their time and efforts freely to this type of service, but also to every practicing physician in his private work.

If the state were required to pay for all the work done by physicians in the charity institutions and also for the charity work done by each individual physician in a private way in his own community, the amount would be overwhelmingly greater than the sum collected from physicians as license taxes.

Physicians do not object to bearing their proportion of the burden of taxation, but

they do resent the enforcement of the principle which requires them to pay for the privilege of bearing a burden which properly belongs to the state.

THE WOMAN'S AUXILIARY OF THE AMERICAN MEDICAL ASSOCIATION

Initiative has always been a dominant characteristic of Southern men and women; and the American Medical Association has been wise enough to profit by plans of organization initiated in the South. The American Medical Association, and all the state medical associations, were reorganized according to the Alabama plan of requiring membership in the county medical society for membership in the state and National organizations. Following this, the state as well as the National associations, have had an era of progress and usefulness not dreamed of before in medical organizations.

A few years ago the wives of the physicians who were members of the Texas State Medical Association, desiring to aid in welfare work, organized a Woman's Auxiliary. It was immediately successful and in an incredibly short time there were established county and district, as well as a state organization, of the physicians' wives of Texas. The Texas organization proved so successful that last year the American Medical Association decided to establish a Woman's Auxiliary in each state in the Union on the Texas plan. Mrs. S. C. Redd, of Houston, who played a prominent part in the auxiliary in Texas, was placed in charge of the National Woman's Auxiliary; and cooperating with the officials of the various state medical associations, she has succeeded in establishing state organizations in most of the states.

The reports from Texas indicate that the Woman's Auxiliaries to the county, state and National organizations have a wide field of usefulness. They not only serve as a medium bringing about a feeling of comradeship among physicians' families and adding greatly to the success of various medical meetings, but the women's organizations in the various counties have been helpful in securing whole-time health officers; they have aided in securing funds for building hospitals; they have assisted in the child welfare movement; they have made many thousands of garments for charity patients; and in many other ways have shown that they possess the same altruistic spirit of their husbands.

The Woman's Auxiliaries do not in the least savor of the feminist movement, but they show a disposition to serve mankind in a way that will mean much for the prestige of the profession of medicine and for the betterment of mankind.

OUR SPECIAL TRAIN TO THE AMERICAN MEDICAL ASSOCIATION MEETING

The suggestion has been made by a number of members of the Southern Medical Association that the Association operate a special train to the American Medical Association meeting in San Francisco, June 25-29, for the convenience of its members and friends. After very careful consideration, it has been decided to do this, and it will be known as "Our President's Special," so named because, among others, it will convey the President of the Southern Medical Association, Dr. W. S. Leathers, and Mrs. Leathers. For this "Special" there has been chosen "The Scenic Route of the World," via Colorado Springs and Salt Lake City, the "quick, cool, scenic way to the Convention City."

The train, a train de luxe, will start from St. Louis, Tuesday, June 19, at 9:00 a. m. The itinerary will be along the banks of the picturesque Meramec River,

through the foothills of the Ozark Mountains to Colorado Springs, where a day's stop will be made so that the scenic wonders of that region may be enjoyed. Immediately upon arrival of the train, sightseeing cars will be waiting to take the party over Colorado Springs, Manitou, Garden of the Gods, Cave of the Winds, etc., and then on that wonderful auto road to the top of Pike's Peak for sunset, returning to Colorado Springs in time for a late dinner at one of the famous hotels. Or those who wish may spend this time at Denver.

Leaving Colorado Springs, the trip leads through the Grand Canyon of the Arkansas, through the Royal Gorge, over Tennessee Pass (a point more than ten thousand feet above the sea level—the Continental Divide), through Eagle River Canyon and the Canyon of the Grand River (through all this in special open-top observation cars).

A stop will be made at Salt Lake City to see that wonderful city. The organ recital at the Mormon Church, the largest pipe organ in the world, will itself be worth the stop-over not to mention a swim in the great Salt Lake where one cannot sink. A trip by electric car will be made to Ogden and Ogden Canyon.

Leaving Salt Lake City, the train crosses the cut-off of the great Salt Lake and then through the famous Feather River Canyon, where many of the moving picture stars are filmed. At the World's Fair, in 1915, this route justly received the official award of "The Scenic Route of the World." On the train one thrill and delight after another will be experienced until the Convention City is reached on Sunday afternoon, June 24, at 5:45 o'clock.

Special round trip tourist rates may be secured for this trip, with privilege of returning by another route. Or if a quick return trip is desired, one may come back over the same route.

Any physician who is a member of his county and state medical associations, whether a member of the Southern Medical Association or not, is most cordially invited to travel on "Our President's Special." If you are going to the American Medical Association meeting this year, use the Southern Medical Association's "Special," and on this long trip enjoy the good fellowship of a group of splendid men, many of whom will be accompanied by their wives and other members of their families, from the states comprising the Southern Medical Association.

For additional information, see the advertisement a few pages further on in this JOURNAL (page 43).

Correspondence

ANAPHYLAXIS AND ALLERGY

Editor, SOUTHERN MEDICAL JOURNAL:

I have been much interested in reading the editorial entitled "Anaphylaxis in Every Day Practice," in the April issue. It is a very timely editorial, but needs some clarification.

The commonly known manifestation of anaphylaxis is anaphylactic shock, while the term allergy, coined by Coca, is now applied to the group of manifestations, asthma, hay-fever, and urticaria. The two groups are closely allied in some respects, but there are several clear-cut and well-recognized differences. First, anaphylaxis is an actively acquired condition, while the hypersensitiveness of allergy is probably either inherited or present at birth; and on close questioning a large percentage of these patients will be found to have shown some evidences of the condition in childhood or infancy. That is, the anaphylactic condition requires a first or sensitizing injection while the allergic state does not.

Secondly, the anaphylactic state, once established, lasts throughout the life-time of the patient, or until he is actively immunized, while there are many cases known where the allergic condition has disappeared spontaneously or without any active treatment.

Thirdly, efforts at active immunization are much more productive of definite results in anaphylaxis than in allergy.

The anaphylactic state can be immunized against in a few minutes or hours, while the allergic state yields only imperfectly to a long series of immunizing injections.

The similarity of the two states lies in that they are both hypersensitiveness to proteins and both give the rapidly oncoming shock following the toxic or exciting injection.

M. T. DAVIDSON, M.D.

Birmingham, Ala.,
April 10, 1923.

ENTRANCE EXAMINATION FOR U. S. PUBLIC HEALTH SERVICE

Editor, SOUTHERN MEDICAL JOURNAL:

Examinations of candidates for entrance into the Regular Corps of the U. S. Public Health Service will be held at the following-named places on the dates specified:

At Washington, D. C.....July 9, 1923
At Chicago, Ill.....July 9, 1923
At San Francisco, Calif.....July 9, 1923

Candidates must be not less than twenty-three nor more than thirty-two years of age, and they must have been graduated in medicine at some reputable medical college, and have had one year's hospital experience or two years' professional practice. They must pass satisfactorily oral, written, and clinical tests before a board of medical officers and undergo a physical examination.

Successful candidates will be recommended for appointment by the President with the advice and consent of the Senate.

Requests for information or permission to take this examination should be addressed to the Surgeon-General, U. S. Public Health Service, Washington, D. C.

H. S. CUMMING,
Surgeon-General.

Washington, D. C.,
April 16, 1923.

Book Reviews

Diseases of the Rectum, Anus and Colon. By Samuel Goodwin Gant, M.D., LL.D., Professor and Chief of the Department of Diseases of the Colon, Rectum and Anus at the Broad Street Hospital, Graduate School of Medicine, New York City. Three octavo volumes, totaling 1616 pages, with 1128 illustrations on 1085 figures and 10 insets in colors. Philadelphia and London: W. B. Saunders Co., 1923. Cloth, $25 net.

From a standpoint of criticism, admitting the unquestioned skill and experience of the author, there is too much Gant and not enough details of the methods of procedure other than those of the author himself. Also, the splendid illustrations quite consistently depict the bare hands of the examiner in the rectum, an uncleanly procedure, which, preserving as it may a more acute sense of touch, is nevertheless not in accord with the teachings of modern proctology.

From a standpoint of praise (and this far outweighs its faults), it is lavishly illustrated with good photographs, sketches and colored plates. It discusses the embryology, anatomy and physiology of the parts as well as the symptoms, diagnosis, treatment and operations of the various diseases described. It supplies a much desired and authoritative system of rectal, anal and colonic diseases, and hence is a valuable reference work. In three volumes, it is by far the most ambitious and complete work ever attempted upon diseases of the rectum, anus and colon.

Social Work in Hospitals; a Contribution to Progressive Medicine. By Ida M. Cannon, R.N., Chief of Social Service, Massachusetts General Hospital, Boston, Mass. New and revised edition. 247 pages. New York: Russell Sage Foundation, 1923.

This pioneer book on social service in connection with hospitals gives a brief outline of the entire subject.

Although this type of work has spread with amazing rapidity in the past ten or fifteen years, the full importance of the subject is still not fully appreciated.

This volume has done much to explain the purposes and practical applicability of social service to hospital administration.

Labyrinth and Equilibrium. Monographs on Experimental Biology. By Samuel Steen Maxwell, M.S., PhD., Professor of Physiology, University of California. Edited by Jacques Loeb, Rockefeller Institute; T. H. Morgan, Columbia University; and W. J. V. Osterhout, Harvard University. With 163 pages, illustrated. Philadelphia and London: J. B. Lippincott Co., 1923. Cloth, $2.50.

The names of the editors of this series guarantee its scientific accuracy. This book, in particular, is a condensation of information concerning the mechanism of the equilibrial reactions of vertebrate animals.

How We Resist Disease. An Introduction to Immunity. Lippincott's Nursing Manuals. By Jean Broadhurst, Ph.D., Assistant Professor of Biology, Teachers College, Columbia University. With 246 pages, 138 illustrations and 4 color plates. Philadelphia and London: J. B. Lippincott Co., 1923. Cloth, $2.50.

The main principles of immunity are here put in plain and simple language, the terminology being as non-technical as possible. It is a very good selection of material from a wide field.

Nutrition of Mother and Child. Lippincott's Nursing Manuals. By C. Ulysses Moore, M.D., M.Sc. (Ped.), Instructor in Diseases of Children, University of Oregon Medical School; Medical Director, Cooperative Infant Welfare Society of Oregon; President North Pacific Pediatric Society; Pediatrist, Multnomah County Hospital and the Florence Crittenden Home, Portland, Oregon. Including Menus and Recipes by Myrtle Josephine Ferguson, B.S., B.S. in H. Ec., Professor of Nutrition, Iowa State College, Ames, Iowa. With 33 illustrations and 235 pages. Philadelphia and London: J. B. Lippincott Co., 1923.

An especially good book which supplies all the information from the most recent work upon infant nutrition.

Mistakes and Accidents of Surgery. By Harold Burrows, C.B.E., M.B., B.S. (Lond.), F.R.C.S., Assistant Surgeon, Royal Portsmouth Hospital; Late Consulting Surgeon, British Expeditionary Force in France; Late Hunterian Professor of Surgery, Royal College of Surgeons of England; Late Senior Assistant Surgeon, Seamen's Hospital, Greenwich. With 470 pages. New York: William Wood & Co., 1923. Cloth, $4.00.

It is only by keeping constantly in mind all possible pitfalls that the most careful surgeon can avoid them. The author describes the common accidents fully and has produced a volume which will be of service to anyone practicing surgery.

Thyroid and Thymus. By Andre Crotti, M.D., F.A.C.S., LL.D., Formerly Professor of Clinical Surgery and Associate Professor of Anatomy, Ohio State University College of Medicine; Surgeon to Grant and Children's Hospitals, Columbus, Ohio. Second edition, thoroughly revised. 774 pages with 105 illustrations and 39 plates in colors. Philadelphia and New York: Lea & Febiger, 1922. Half morocco and gilt top, $15.00.

This second edition of a most elaborate work on the thyroid and thymus comprises all the good points of the former edition and embodies various improvements suggested by criticisms of the first edition. Notable additions and corrections have been made, chief among which is a valuable bibliography, without which no work of this nature can be called complete. Likewise, the importance of basal metabolism is duly stressed and proper caution is urged in accepting too literally the results of the epinephrin test of Goetsch.

The book merits a more cordial reception than that accorded the former edition, because it has been transformed and enlarged from a most mediocre book to a valuable and very comprehensive work.

The Medical Clinics of North America. Philadelphia Number, 26 Text Figures. 264 pages. Philadelphia and London: W. B. Saunders Co., January, 1923. Paper, $12.00 per annum (bi-monthly).

The clinics are up to their usual standard of excellency. In such a number of creditable presentations of subjects it is hard in justice to all to make special mention of individual clinics. However, those of Dr. David Reisman on "Coronary Thrombosis, With an Account of the Disease in Two Brothers and Remarks Upon Diagnosis and Treatment;" Dr. Thomas McCrae on "Hypertension and Nephritis," and "Early Treatment of Empyema by Asperation;" and Dr. Henry K. Mohler on "The Value of Basal Metabolic Studies in the Differential Diagnosis of Conditions Resembling Hyperthyroidism: Presentation of Four Cases Illustrating Its Value," are worthy of especial commendation.

The Successful Physician. By Verlin C. Thomas, M.D., Visiting Physician to Franklin Hospital, San Francisco. Philadelphia and London: W. B. Saunders Co., 1923. Cloth, $4.00.

This is a very good book of its kind, but this recommendation needs qualification. It gives many useful pointers on how a physician should dress, arrange his office, his furniture, pictures, and train his personality. In other words, in minute detail it tells how one should appear like a good and successful physician. However, by devoting so many pages to the outward *appearance*, it belittles or underrates, in a way, the importance of *being* the physician who achieves results. However, books of social, political or medical etiquette doubtless all serve some useful purpose.

Evolution and Christian Faith. By H. H. Lane, Professor of Zoology, University of Kansas. With 214 pages. Princeton: Princeton University Press, and London: Humphrey Milford, Oxford University Press, 1923. Cloth, $2.00.

"But if the Christianity of the New Testament is good and true, as we believe it is, the discoveries of science should not contradict it, but complete its verification." The author then quotes F. H. Giddings to show that "As a matter of fact they have been verifying it. The generalizations of physics and biology have verified the factor of truth in the doctrine of foreordination. The generalizations of biology and psychology have verified the factor of truth in the doctrine of inherited sin. And now, our latest psychology verifies the doctrine of regeneration."

As the above quotation used by the author indicates, this work is an attempt to reconcile modern biology with Christianity. Though the ideas are not markedly original, it is well written and contains many scientific facts discussed from the viewpoint of the scientist who also has a religion.

Other Books Received

Environment and Resistance in Tuberculosis. By Allen K. Krause, A.N., M.D., Associate Professor of Medicine, Johns Hopkins University; Director, Dows Tuberculosis Research Fund, Johns Hopkins University; Physician-in-Charge, Phipps Tuberculosis Dispensary, Johns Hopkins Hospital; Lecturer, Trudeau School of Tuberculosis; Editor, American Review of Tuberculosis. With 137 pages. Baltimore: Williams & Wilkins, 1923. Cloth, $1.50.

Southern Medical News

ALABAMA

Dr. Seale Harris, Birmingham, by invitation delivered two lectures to the Neuro-Psychiatric School of the Veterans Bureau, Washington, D. C., the last of March.

The Mobile County Tuberculosis Sanatorium, Cottage Hill, was opened March 4. More than a thousand people attended the opening exercises and each brought a book for the hospital library. Dr. L. W. Roe and Dr. E. S. Sledge will be the attending physicians.

The inmates of the Kilby prison presented Dr. C. H. Smith, Montgomery, with a gold ring on his retirement as physician inspector for the State convict department.

The Standard Oil Company has donated 1,000 gallons of oil for use in the mosquito eradication campaign to be conducted by the State Department of Health this spring.

Dr. W. C. Gewin, Birmingham, has been appointed Consulting Surgeon and Surgeon General of Alabama's penal institutions.

Dr. Edwin O. Williamson, Gurley, has been elected President of the Madison County Medical Society to fill the unexpired term of Dr. C. A. Grote, who has gone to North Carolina.

Dr. Malcolm Mooney Neel, Geiger, and Miss Martha Mae Dillard, Atlanta, Ga., were married February 22.

Deaths

Dr. Lewis Coleman Morris, Birmingham, aged 51, died suddenly March 23 from heart disease.

Dr. Henry E. Battle, Andalusia, died in March from heart disease.

ARKANSAS

The Davis Hospital, Pine Bluff, recently became a standardized hospital according to the requirements of the American College of Surgeons. The following staff has been appointed: Dr. B. D. Luck, Chairman and Surgeon; Dr. W. T. Lowe, Gynecology; Dr. J. F. Crump, Eye, Ear, Nose and Throat; Dr. W. G. Pittman, Laboratory; Dr. J. T. Palmer, Obstetrics; Dr. C. K. Caruthers, Anesthesia; Dr. E. C. McMulien, Internal Medicine; Dr. J. S. Jenkins, Orthopedics.

Dr. C. C. Kirk, Superintendent of the State Hospital for Nervous Diseases, Little Rock, because of the overcrowded condition of the hospital, has requested the county judge and sheriff to commit all mentally deficient persons in their jurisdiction to the county jail in future instead of making application for admission to the State Hospital. The normal capacity of the institution is 1,850, and they now have 2,036 inmates.

A new 125-bed hospital, to cost $600,000, will soon be built at Little Rock, according to announcement by Dr. W. F. Smith, Division Surgeon, Missouri Pacific Railroad.

El Dorado is to have a new Catholic hospital erected at a cost of $40,000. It will contain a charity ward for the housing of oil field workers who may be injured in the course of their work.

Dr. Thomas B. Snoddy, Conway, is now in the U. S. Indian Service and has gone to Towaoc, Colo., to take charge of the Ute Mountain Indian School Hospital.

Deaths

Dr. William E. Arnold, Prescott, aged 85, died February 25 following a long illness.

Dr. Arthur A. Milligan, Rogers, aged 63, died February 9.

Dr. Jules G. Belknap, Sulphur Springs, aged 67, died February 26 from influenza and pneumonia.

Dr. Samuel William Allen, Little Rock, aged 62, died in Chicago, February 10.

Dr. Alexander Everett Harris, Little Rock, aged 44, died March 7.

Dr. Boulanger Gwaltney, Traskwood, aged 36, died February 19.

DISTRICT OF COLUMBIA

Mr. C. P. Loranz, Birmingham, Ala., Secretary-Manager of the Southern Medical Association, was in Washington recently in conference with the Committee on Arrangements for the annual meeting of the Association, which meets in Washington in November. Dr. Thomas A. Groover is General Chairman of the local committee.

Dr. Charles S. White, Chairman of the Medical and Red Cross Committee, has announced that all physicians, nurses and druggists of Washington will give free treatment when necessary to the Shriners and visitors during the session of the Imperial Council of the Mystic Shrine in June. The service will include emergency dentistry, eye glass repairing, nursing and prescriptions from druggists. Twenty army ambulances and ten private ambulances will be constantly on duty.

Deaths

Dr. Samuel W. Murphy, Washington, aged 85, died at the John Dickson Home February 27 from senility.

Dr. Joseph N. Gardner, Washington, aged 63, died February 22 from heart disease.

GEORGIA

Baldwin County Medical Society has elected Dr. H. D. Allen, Sr., President; Dr. Jno. W. Oden, Vice-President; Dr. L. H. McCalla, Secretary-Treasurer.

Bibb County Medical Society has elected Dr. C. C. Hinton, President; Dr. H. J. Peavy, Vice-President; Dr. O. R. Thompson, Secretary-Treasurer.

Brooks County Medical Society has elected Dr. A. J. Smith, President; Dr. E. L. Jelks, Secretary-Treasurer.

Campbell County Medical Society has elected Dr. A. B. Jones, President; Dr. R. T. Camp, Vice-President; Dr. A. J. Green, Secretary-Treasurer.

Cherokee County Medical Society has elected Dr. N. J. Coker, President; Dr. J. M. Bates, Vice-President; Dr. George C. Brooke, Secretary-Treasurer.

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

SUGAR FINDINGS IN NORMAL AND PATHOLOGICAL SPINAL FLUIDS*†

BY A. G. KELLEY, M.D.,
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The following findings and conclusions are based on a quantitative study of a reducing substance in approximately one thousand normal and pathological cerebrospinal fluids. Of this number, 408 were from patients with sufficient clinical data to justify the grouping to be discussed later. Efforts have been made to determine the chemical nature of this reducing substance and the effect that the intravenous injections of dextrose have on the normal sugar content in the cerebrospinal fluid of rabbits.

SUGAR CONTENT OF NORMAL CEREBROSPINAL FLUID

(A) Normal cerebrospinal fluid contains a sugar in amounts varying from 0.040 to 0.095 per cent (40 to 95 milligrams per 100 c. c. of fluid). This substance reduces Fehling's solution, is fermentable, is dextro-rotatory and when treated with phenylhydrazine gives crystals of glucozone.

A review of the literature on this subject is rather confusing and offers many varied opinions. Connall[1] states that the reducing substance found in cerebrospinal fluid is galactose. Halliburton[2] believes it to be pyrocatechin. The observations of Rossi,[3] Boyd,[4] Hopkins,[5] Schloss and Schroeder,[6] Nawrakski,[7] and Zdarek[8] indicate that it is fermentable, dextro-rotatory and gives crystals of glucozone when treated with phenylhydrazine. They conclude that it is probably dextrose.

In my own determinations the following method was used: 500 c. c. of mixed normal cerebrospinal fluids were placed in a flask. The amount of reducing agent was then determined by the Folin and Wu method[9] and was found to be 0.055 per cent (55 milligrams per 100 c. c. of fluid). Fifty cubic centimeters of absolute alcohol were added to the flask. This caused a precipitation of the protein. The total fluid was filtered through paper to remove the precipitate (protein substance). Two cubic centimeters of HCl (C.P.) were added to the filtrate, which was then evaporated to 50 c. c. at a temperature of 45° C. This concentrated fluid was again filtered and the reducing substance contained therein determined by the Folin and Wu method. Five cubic centimeters of this concentrated cerebrospinal fluid contained 0.027 per cent (27 milligrams), or 0.540 per cent (540 milligrams per 100 c. c. of fluid, concentrated). This is equivalent to 0.054 per cent (54 milligrams)

*From the Clinical Laboratory of Dr. A. G. Kelley.

†Read in Section on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

per 100 c. c. of the original mixed fluids. The concentrated fluid obtained by the above method was then further examined and gave the following findings: acid reaction, dextro-rotatory and fermentation with yeast with the production of alcohol and carbon dioxid.

(B) *Effect on Sugar Content of Cerebrospinal Fluid Inoculated with (a) Colon Bacillus, (b) Staphylococcus Aureus, (c) Pneumococcus, Type I, (d) Meningococcus, Normal.*—Of numerous experiments aimed at determining the sugar content of cerebrospinal fluid after inoculation with the above bacteria, the following example is offered as typical of the technic employed and the results obtained.

Mixed normal sterile cerebrospinal fluids containing a reducing substance of 0.062 per cent (62 mg. per 100 c. c. of fluid) were used.

Test.—Set up five test tubes about 16 x 150 mm. Put ten c. c. of normal sterile cerebrospinal fluid into each and inoculate:

(a) with colon Bacillus,
(b) with staphylococcus aureus,
(c) with pneumococcus, type I,
(d) with meningococcus normal,
(e) with none, (control).

Incubate twelve hours at 37.5° C. Determine per cent of sugars.

No.	Bl. Sug. (Before Dextrose Inj.)	C. S. Fl. Sug.	Dextrose (Intraven)	Results
1.	0.067	0.061	1.20 G. hourly for ten hours	No dextrose in urine. No increase in the amount of sugar in cerebrospinal fluid.
2.	0.061	0.057	1.20 G. hourly for ten hours	Both rabbits recovered with no ill effects.
3.	0.081	0.074	1.35 G. hourly for ten hours	No dextrose in urine. No increase in sugar in cerebrospinal fluid. Both rabbits recovered with no ill effects.
4.	0.074	0.069	1.35 G. hourly for ten hours	
5.	0.059	0.055	1.55 G. hourly for ten hours	In both rabbits dextrose was present in the urine after two hours. Albumin in urine for several days. No increase in sugar content in cerebrospinal fluid. Rabbits recovered.
6.	0.098	0.090	1.55 G. hourly for ten doses	
7.	0.055	0.048	1.65 G. hourly for ten hours	Dextrose in urine after two hours. Diminished quantity of urine after four hours; nine hours, anuria. No increase in amount of sugar in cerebrospinal fluid. Rabbit died after 20 hours. Autopsy. Pathology: Parenchymatous degeneration of both kidneys.

From the following three rabbits all of the cerebrospinal fluid was removed by occipito-atlantoid puncture:

8.	0.062	0.060	1.55 G. hourly for ten hours	Dextrose in urine after two hours. Cerebrospinal fluid removed after 8 hours. "Clear—globulins, neg." Sugar content, 0.110 per cent. Rabbit recovered.
9.	0.051	0.049	1.55 G. hourly for ten hours	

(After the removal of the cerebrospinal fluid from this rabbit and before the dextrose injections were started, 1 c. c. of a saturated solution of NaCl was injected into the subarachnoid space so as to determine whether the hypertonic solution in the subarachnoid space and spinal canal would bring over an increased amount of sugar into the cerebrospinal fluid.)

10.	0.064	0.061	1.55 G. hourly for ten hours	Dextrose in urine after two hours. Cerebrospinal fluid removed after 8 hours. "Clear—globulins, trace." Sugar content, 0.265 per cent. Rabbit recovered.

(After the removal of cerebrospinal fluid from this rabbit and before the dextrose injections were started, 1 c. c. of mercurialized serum was injected into the subarachnoid space so as to determine whether this irritating substance in the subarachnoid space and spinal canal would bring over an increased amount of sugar into the cerebrospinal fluid.)

Dextrose in urine after two hours. Cerebrospinal fluid removed after 7 hours. "Cloudy—globulins, 4 plus. Sugar content, 0.162 per cent. (Note.—The sugar content of the mercurialized serum was 0.125 per cent.) Rabbit recovered.

These experiments were repeated several times and the results were approximately the same as the above findings.

Bacterium	Sugar Content
(a) Colon Bacillus	0.000%
(b) Staphylococcus Aureus	0.008%
(c) Pneumococcus, Type I	0.012%
(d) Meningococcus normal	0.022%
(e) Control	0.061%*

In the determination of the effect of colon bacillus inoculation it was found that the reducing substance disappeared. As a control to this observation 0.070 per cent pyrocatechin was added to two tubes of broth, inoculated with the colon bacillus, and incubated for eighteen hours at 37.5° C. There was no reduction in the amount of pyrocatechin in these controls.†

(C) *Effect on Sugar Content of Cerebrospinal Fluid of Rabbits Following Large Intravenous Injections of Dextrose (Experimental).*—For this experiment ten large rabbits were selected, each weighing approximately 1600 grams. The dextrose used was a gram-molecular solution (18 per cent) in physiological salt solution.

From this experimental work it seems: (a) that normal cerebrospinal fluid contains a sugar, average amount about 0.055 per cent (55 milligrams per 100 c. c.); (b) that this reducing substance is not pyrocatechin, but is a monosaccharid (dextrose?) which remains unchanged in an acid medium, is dextro-rotatory and is fermented with yeast with the production of alcohol and carbon dioxid; (c) that this sugar disappears after inoculation with colon bacillus and is lessened after inoculation with staphylococcus aureus, pneumococcus type I and meningococcus normal; and (d) that under normal conditions the percentage of sugar in the cerebrospinal fluid is not changed by intravenous injections of dextrose.

SUGAR CONTENT OF CEREBROSPINAL FLUID IN DISEASE

(a) Quantitative estimations of the reducing substance were made in 408 specimens of cerebrospinal fluid obtained from patients having various diseases. The average sugar content in the various groups of diseases was as follows:

Disease	No. Cases	Average Sugar Content
Syphilis of the nervous system (Before treatment)	195	0.021%
Syphilis of the nervous system (After treatment)	100	0.062%
Paresis	20	0.042%
Epidemic meningitis	39	0.019%
Influenza	14	0.048%
Epilepsy	10	0.071%
Diabetes	10	0.210%
Brain tumor	8	0.069%
Encephalitis	5	0.055%
Encephalitis with sepsis (due to staphylococcus aureus)	1	0.008%
Pneumococcic meningitis	4	0.012%
Tuberculous meningitis	3	0.055%
Poliomyelitis	3	0.060%
Moribund (dying)	5	0.020%

Method employed, Folin and Wu.

(b) *Sugar content of cerebrospinal fluid in clinical syphilis of the nervous system after treatment.*

Under Section II-a in the tabulated report you will note that the average sugar content in cerebrospinal fluid in syphilis of the nervous system before treatment is 0.021 per cent (21 milligrams per 100 c. c. of fluid). The findings after treatment where the Wassermann and colloidal gold curve had become negative gave an increase in the sugar content. Based on one hundred cases the average is 0.062 per cent (62 mg. per 100 c. c. of fluid). In our "follow-ups" on these cases we find that as the patient improves the sugar content increases.

(c) *Effect on sugar content in cerebrospinal fluid caused by treponema pallidum in syphilis of the nervous system.*

Fifty tubes of normal sterile cerebrospinal fluids were inoculated with a stock culture of treponema pallidum grown in serum kidney medium. The reducing substance contained in these fluids was estimated before and after incubation, eight days at 35° C. The sugar content was practically unchanged in forty-two of the specimens after incubation. The following is the result obtained in the eight remaining specimens:

Tube No.	Sugar Content When Inoc. Per Ct.	Sugar Content After Incubation, 8 Days Per Ct.
5	0.054	0.032
8	0.062	0.051
30	0.048	0.040
34	0.056	0.034
39	0.055	0.048
40	0.059	0.036
46	0.052	0.037
48	0.060	0.022

*On standing at room or incubator temperature any sugar solution will show a slight decrease.

†This experiment was repeated several times.

Although in the above experiment the sugar content was not influenced in forty-two of the specimens inoculated with the treponema pallidum, in the remaining eight specimens the reduction of the sugar content was so marked as to suggest that the low percentage of reducing substance found in the cerebrospinal fluid in syphilis of the nervous system may be due to the action of the treponema pallidum on the sugar normally present. It is probable that the sugar may be utilized as food by the organism. The negative results in the forty-two specimens may be due to the fact that as yet we have no method by which the treponema pallidum grows abundantly.

CONCLUSIONS

From our observations on the sugar content of cerebrospinal fluid in certain diseases and our effort to determine the influence of the treponema pallidum on the sugar content of cerebrospinal fluids it seems justifiable to conclude: (1) that the sugar content of cerebrospinal fluid is decreased in untreated cases of syphilis of the nervous system, in meningitis due to the meningococcus, the staphylococcus aureus and the pneumococcus, and in moribund cases; (2) that as cases of syphilis of the nervous system are treated the sugar content gradually approaches the normal and on this account repeated estimations of the sugar content of the cerebrospinal fluid in these cases may possibly be of prognostic value; and (3) that there is sufficient evidence to warrant the opinion that the treponema pallidum, when present in the cerebrospinal fluid, utilizes the sugar normally present in the fluid.

NOTE.—I wish to express my thanks to Dr. Charles E. Dowman, of Atlanta, Ga., for the free use of his clinical material and helpful suggestions; also to Mr. Leo Braun, of Atlanta, Ga., for valuable aid in the various chemical analyses.

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DISCUSSION

Dr. John A. Lanford, New Orleans, La.—Dr. Kelley has shown conclusively that the determination of the sugar content of the spinal fluid is of importance in the treatment of cerebrospinal syphilis. He has shown further that all infections of the cerebrospinal fluid, due to demonstrable organisms, are associated with a decrease in the sugar content of the fluid, this decrease being below 40 milligrams in every instance, with the one exception of tuberculosis, which, in its early stages, is usually associated with a sugar content of about 55 to 60 mgs. Later on, as the tubercle bacilli grow and increase in number, there is a decrease in the sugar content.

Another point that might be well to bring out is that the spinal fluid in encephalitis lethargica has been found to show a sugar content of about 55 to 76, as reported recently by Foster, who had the opportunity of studying a small series of cases. This has been confirmed in the Laboratory of Touro Infirmary.

It is evident, then, that this test is of particular clinical value in following up cases of cerebrospinal syphilis.

Dr. Kenneth M. Lynch, Dallas, Tex.—Dr. Kelley is able to identify the reducing substance in the cerebrospinal fluid as probably dextrose, and to show that it runs definitely below the normal blood sugar quantities. It runs 40 to 95 mg. per 100 c. c., whereas the normal blood sugar runs about 60 to 120 mg. It is noted that there is an approximately proportionate variation between the low and high normals of cerebrospinal and blood sugar, and it would be interesting to compare the two in the same cases to determine if there is a definite proportion; for instance, if low normal fluid sugar occurs in company with low normal blood sugar, or if, on the other hand, there is no definite relation between them. It may be that in the normal process of secretion of cerebrospinal fluid sugar is passed in definite proportion to the amount in the blood. Such a thing is suggested by comparing the blood and fluid sugars in the rabbits in Experiment V. It would be interesting also to make this comparison in diabetes, as it is noted that here there is a high fluid sugar content and the same proportion may apply.

There is a distinct reduction in the sugar content in case of infection of the fluid by organisms which occur in large numbers and utilize sugars, as may be reasonably expected, but there is no particular change in certain central nervous system diseases not accompanied by bacterial growth in the fluid or particular alteration of the secretory apparatus.

In syphilis of the nervous system there is a definite reduction which is improved even to a return to the normal by anti-syphilitic treatment. This, amply confirmed, may possibly be used to support both diagnosis and prognosis. If, as Dr. Kelley suggests, the reason for the reduction is utilization of sugar by the spirochete, the improvement would seem to indicate reduc-

tion or eradication of the organisms. One must consider, however, the possibility of disease of the secretory mechanism with a possible alteration of the constituents of the secretion, in which case return to the normal would indicate improvement of the secretory apparatus. Whether either of these explanations is applicable cannot be accurately concluded, for while there did occur in Experiment VI a reduction of the sugar in 8 of 50 tubes of cerebrospinal fluid incubated with cultures of the spirochete, there was no reduction in the remaining 42. In the face of this inconclusive experiment and the evident small number of the organisms in the fluid in cerebrospinal syphilis, one must doubt that the reduction which occurs is because of utilization by the spirochete. In fact, disturbance of the secretory apparatus must be borne in mind in any case of reduction, including the moribund cases, just as the state of the specific secretory apparatus must be subject to question in case of any altered secretion.

Dr. Tom A. Williams, Washington, D. C.—It has been suggested that the explanation of the diminution of sugar is dependent upon the increase of organisms in the spinal fluid. In looking at Dr. Kelley's table another interpretation presented itself to me, namely, the diminution of sugar in the fluid is proportionate to the leucocytic power of the disease in question. For instance, in staphylococcus meningitis, where there is an enormous number of white cells, the sugar content was 0.008 per cent, whereas in pneumococcus meningitis it was 0.012 per cent. These are suppurative diseases. In tuberculosis and influenzal meningitis the reduction was comparatively large. In syphilis, where there is a very abundant lymphocytic reaction, in many cases the reduction was considerable, namely, 0.021 per cent. As the disease improved and the leucocytic reaction diminished, the sugar diminution ceased, so that I would ask the question of pathologists who are interpreting these kind of findings, whether or not it is not a function of the leucocytes, and the diminution of sugar due to a large degree to increased absorption by leucocytes resulting from the presence of organisms in the fluid or in the meninges.

Dr. Kelley (closing).—The different amounts of sugar in the cerebrospinal fluids from patients suffering with the various diseases may be due to the effect of the organism causing the infection. If the treponema pallida grew as abundantly as the staphylococcus and could be cultivated as easily, I believe that it would completely reduce the sugar content in the cerebrospinal fluid of patients with syphilis of the nervous system. In our routine examination of cerebrospinal fluids we have always looked for sugar. My attention was first called to the fact that clear fluids with a decreased sugar content usually gave a positive Wassermann reaction and a syphilitic colloidal gold curve. After successful treatment the sugar content returned to normal (40 to 95 mg. per 100 c. c.). In view of these findings I decided to try to grow the treponema pallida in normal human cerebrospinal fluid.

THE TREATMENT OF ARTERIAL HYPERTENSION*

By Ralph N. Greene, M.D.,
Jacksonville, Fla.

In retrospective consideration of years of activity in the practice of medicine, physicians must, because of daily contact with ailing mankind, be impressed with the ebbing and flowing of waves of popularity enjoyed by ever-changing fashionable ailments.

Years ago, while I was in institutional medical work, it was a noteworthy fact that concurrently with public affairs of widespread interest, elections, Fourth of July celebrations, and other similar occasions, a growing enthusiasm resulted in intense mental concentration and terminated in a recrudescence of psychotic episodes and institutional commitments of neurotically predisposed individuals.

Possibly no phase of the work of the neuro-psychiatrist is more frequently encountered than the matter of dealing with the impressionable person who has been stigmatized as a high blood pressure case. The pronunciation of a diagnosis of high blood pressure, given with an attitude of well-meant but misdirected concern, has the effect of thrusting into the conscious mentality of nervous, irritable, exhaustible people, who are combating ill-defined subconscious mental conflicts, a phantom, which by process of psycho-pathological transmutation, becomes a material horror. High blood pressure has come to be the fashionable ailment of the day.

As it was formerly routine practice to scrutinize carefully every patient's tongue, a procedure which I fear has somewhat fallen into disuse, it has now become commonplace to take the patient's blood pressure.

The old modest type of anaeroid sphygmomanometer became so important in the physician's armamentarium as to justify the production of a wall type of instrument with a dial as large as the dial of a steam gauge that is commonly in use on batteries of high pressure steam boilers.

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*Read in Section on Neurology and Psychiatry, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

During the application of this impressive piece of apparatus the patient gazes upon the ascending indicator hand with increasing concern and alarm as the arm band constricts relentlessly and even painfully, because the operator in his zeal occasionally applies pressure far above the degree necessary to abolish the arterial impulses.

We take into consideration a nervous acceleration of pulse rate in routine life insurance examinations. In blood pressure readings there is without doubt a nervous reaction, sometimes one of fear and apprehension, resulting in variances of as much as forty degrees from the true blood pressure reading. This can be well demonstrated by taking three readings routinely and observing marked fluctuations at the same sitting in certain types of nervous individuals.

Dr. M. A. Mortensen, in the *Bulletin of the Battle Creek Sanitarium,* March, 1922, invites attention to fluctuations in blood pressure readings, and offers as an opinion that the diastolic pressure is not observed to vary over ten to fifteen millimeters; whereas the systolic reading ranges as high as forty millimeters, due, he believes, to apprehension, worry, emotional disturbances and nervous tension. Many observers regard the diastolic reading as of greater importance than the systolic reading regardless of the astonishingly high systolic readings sometimes encountered.

Mortensen cites two cases, one with a systolic pressure of 250 and a diastolic of 90. This case showed no urinary findings, fair physical activity, and no subjective symptoms except intermittent claudication with a slight increase in the nitrogenous blood waste.

The other patient showed a systolic pressure of 250 and a diastolic of 160. There were premonitory symptoms of coma, headaches, partial loss of vision, nausea, and urine showing albumin and casts and a dangerous percentage of nitrogenous blood waste.

It is probable, therefore, that diastolic readings give a better index to the cardio-renal status and the neurotic elements than the systolic readings.

The literature would seem to indicate that Mortensen's statement that persistence of albumin in the urine is not necessarily evidence of renal insufficiency, and that, in general, observation on cases showing a low diastolic pressure encourages a more favorable prognosis than in those cases showing a high diastolic pressure.

There is uniformity of opinion as to technic in taking systolic pressures, this reading being taken at the cessation of arterial pulsation. Care should be taken to use a minimum of pressure and to complete the operation as quickly as is consistent with accuracy.

The true diastolic reading is taken at the end of the fourth phase when the distinct click changes to a dull sound, but the more common practice in reading the diastolic is to register the pressure when the sound of the pulse beat disappears.

Mortensen and others are of the opinion that a diastolic reading thus obtained is usually from four to ten millimeters below the true diastolic reading.

Pulse pressure is taken to mean the difference between systolic and diastolic pressures, the usual average being given as 120 systolic and 80 diastolic, 10 per cent variations being within the bounds of normal.

Arthur Hunter and O. H. Rogers report an analysis of 62,000 systolic pressures in men and 5000 in women, which seem to indicate that the prevailing statement that one's blood pressure should be one hundred plus one's age is not borne out. Mortensen states that the figures of Hunter and Rogers would justify us in modifying the statement that the normal pressure should be one hundred plus one-half of the age.

Judson and Nicholson (*American Journal of Diseases of Children,* October, 1914) state that systolic pressure in children of ages from three to fifteen ranges from 80 to 109.

Significance should be attached to the statement of Mortensen that a systolic pressure persisting above 140 and a diastolic above 90 is evidence of some change taking place in the vascular and renal systems.

Mosenthal, in an article appearing in the *Medical Clinics of North America,*

January, 1922, details the investigations of Bright, who in 1836,

"Observed that cardiac hypertrophy and dilatation were often present in nephritis. Such changes in the heart have been and are still considered to indicate that an increased blood pressure existed during life. This conclusion is correct in the majority of cases."

Mosenthal believes that kidney diseases and hypertension are closely related, but is also of the opinion that we are taking unwarranted liberties when we assume that hypertension necessarily indicates a condition secondary to kidney disease. Mosenthal quotes Janeway, Passler and Heineke, who demonstrated that reduction of kidney substance results in increased blood pressure. He shows, however, that a total removal of both kidneys does not bring this about.

O'Connor, Monakow and Mayer show that prostatic hypertrophy with its mechanical interference with urinary elimination often results in hypertension, which condition returns to normal after the use of the catheter and operation.

Complete anuria, such as occurs in bichlorid poisoning, is not necessarily attended with hypertension.

Mosenthal is of the opinion that there is a relationship between urinary flow and hypertension, but that there is not a mathematical increase in the latter as the former progressively diminishes.

Mosenthal states that there are two factors concerned in maintaining the arterial blood under pressure. These are the volume of blood injected into the arterial reservoir with each heart beat, and the tonicity of the arteries both large and small, and in general that the heart beat has to do as the agent applying pressure and that while the heart is not beating, that is, during systole, the degree of arterial pressure depends principally on the tonicity of the arterial wall. He states, by way of illustration, that a system of rigid pipes having a pump at one end and an outlet at the other shows increase of pressure of the contained liquid during the pumping act, and a zero pressure within the inelastic walls during the rest interval.

It has been shown that extensive arterial sclerosis may occur without much change in blood pressure, namely, in the cases wherein blood vessel changes have been primary.

The more frequent type is, however, when increased pressure and hardening occur simultaneously, the pressure having apparently brought about the changes in the vessels.

"If rigidity of the blood vessels, arterial sclerosis, lowers the diastolic pressure and raises the systolic pressure but slightly, where are we to seek the causes of hypertension. There can be only one factor responsible for it under the circumstances, and that is augmented action on the part of the heart and blood vessels" (Mosenthal).

O'Hare and Boas have recently shown that nervous influences cause blood pressure to rise and fall in a most bizarre way.

From an extensive review of the literature on the treatment of hypertension, taking into consideration some personal experiences with nervous subjects, I am convinced that hypertension is the big problem that is presented to the neuropsychiatrist, and that it is a subject worthy of constant effort and attention that these patients may be saved from cerebral arteriosclerosis with consequent dangers from dementia, psychotic episodes, psychoneurosis, apoplectic insults and frank hemorrhages.

Kidney changes resulting in toxic insanities are of particular interest to the psychiatrist, whereas heart changes present problems for the internist.

A prominent teacher of internal medicine states that he knows of no condition except perhaps an acute diphtheria or an acute malaria wherein the medical man may be of as much help to his patients as when a case of cardio-vascular-renal disease with hypertension presents itself.

If in a hypertension case, after careful examination, we determine that the heart and kidneys are not seriously involved, we eliminate the matter of focal infections and in general satisfy ourselves as to the nature of the causative factors, we should endeavor to have the patient adjust his mental attitude toward the condition.

It is not an infrequent experience for a patient who presents himself for examination to walk into one's consultation room apparently in excellent general health and relapse suddenly into a state

of emotional instability and in a sobbing lacrimose manner announce, "Doctor, I have high blood pressure."

These unfortunate patients should be taught and assured that hypertension is a compensatory process for a condition present, be it heart, kidney or purely nervous influences, and that measures aimed routinely at merely reducing pressure in any drastic way are more harmful than helpful.

Rest is the prime factor in securing results, and this takes into consideration routine physical relaxation and mental repose secured by tactful advice and suggestions which allay anxieties, worry and fear. Rest for even fifteen minutes under favorable conditions reduces systolic pressure and to a lesser degree diastolic pressure. Overactive nervous impulses affect the heart and arteries, and as systolic pressure is more influenced by rest than diastolic the heart is therefore more favorably influenced than the arteries.

The matter of fluid intake, therefore, if properly controlled, offers a therapeutic instrument for the tonicity of the arteries and the diastolic pressure. Phlebotomy, in grave cases, is not to be forgotten.

Detailed explanatory remarks to the patient accomplish the definite purpose of regulating fluid intake and have a favorable effect on the neurotic case in that the interest on the part of the doctor allays apprehension and invites confidence. The withdrawal of a few cubic centimeters of blood for serological examination is often followed by marked reduction of pressure due, of course, to psychic effect.

Patients should be instructed to take the amount of fluid they have been accustomed to take for a period of twenty-four hours, this to include with accurate measurement all liquid food. The amount should then be reduced 25 per cent, and later it may be necessary to further reduce the fluid intake 50 per cent, always keeping tab on the urine and kidney functional index.

The literature is teeming with articles on the influence of diet on hypertension. An opinion seems to be prevalent that food substances causing an increase in blood pressure are principally the purine bodies in meats and soups, and for this reason glandular organs being more heavily endowed with the extractives are more likely to increase blood pressure than other parts of the animal, and that meat, if boiled in two waters, has the least effect in raising blood pressure.

Carter, Howe and Mason, in an article on diet in hypertension, set forth these facts and state that overeating seems to be one of the chief fators in the production of hypertension.

Alcohol is said to have little influence on pressure if taken in moderate doses, but large doses of alcohol probably reduce pressure. J. H. Musser, in the *New York Medical Journal,* October, 1920, regards drugs as of little value, uses iodids only for syphilitics, reserves nitrites for grave emergencies, and condemns benzolbenzoate.

Fred M. Allen, in the *Journal of the American Medical Association,* March, 1920, warns us that in hypertension the organism has to force a filtrate of water and dissolved substances through a damaged and blocked glomerular filter, and advises restriction of fluid and salt. He states that the measures are only palliative, that the mechanics of hypertension remain unsolved, and pleads for the discontinuance of the widespread abuse of nitrites and iodids.

It is a well known clinical fact that with the reduction of body weight and the lowering of the red cell count in overnourished cases, hypertension is benefited. The physician is the sole judge of the degree of reduction of food and liquids and body weight which may be permissible in an individual case.

Moschkowitz, *American Journal of Medical Science,* April ,1920, advises that the attainment of minimum weight, alone by diet and exercise, has a remarkable effect in cases of compensated hypertension. He advises chloral in small doses, repeated over long periods, and remarks that caffein, which lessens the fluid content of the body and relieves the heart, is beneficial.

Radium is credited with powers of reducing blood pressure, it having been noted after treatment of cases for other conditions in which hypertension had been noted, a material reduction of pressure followed. Intravenous administration of radium emanations are said to be followed by reduction of the blood pressure over prolonged periods.

Electricity, high frequency in the form of the Tesla or D'Arsonval current, given in the form of auto-condensation with the patient reclining, is rewarded with a state of mental and physical relaxation during the application of the current. This treatment is the application of heat resulting in stabilizing in an indefinite manner pressure and resistance with consequent lowering of the blood pressure. It is probable that this particular treatment may have some regulating influence over a condition of endocrin imbalance. The electrical treatment at least has the effect of bringing the nervous over-active hypertension case to one's treatment room for a period of twenty minutes of absolute rest and relaxation in the midst of a business day and is rewarded by giving more satisfactory results and more last'ng effect than is usually observed following the administration of drugs alone.

In conclusion, permit me to state that hypertension cases seen by the neuropsychiatrist are potentially mental subjects. They require comforting assurances, but at the same time a clear understanding that untreated they are subject to the dangers of developing brain, heart and kidney diseases. They should be trained in the habit of quiet living, moderate salt intake, and reduced fluid intake to a degree compatible with renal health. They should learn that drugs are not used for hypertension ordinarily, but are applied for specific complications. Hypertension patients should be educated to a realization that less worry and more optimism are desirable. Food should be desired by the hypertension patient in quantities only sufficient to maintain a minimum of weight compatible with health. They should learn that using teeth other than for digging one's grave, figuratively speaking, in suicidal gourmandizing practices at the dining table, will surely be rewarded by a reasonable degree of good health, happiness and longevity.

DISCUSSION

Dr. Lewis M. Gaines, Atlanta, Ga.—Undoubtedly the emotions play a very prominent part in the production of transitory hypertension, and a patient under a long continued emotional strain may possibly develop a permanent arterial hypertension.

Two cases occur to me at this time. One of them, a woman, 35 years of age, was deserted by her husband and left with an infant. She had to make her way in the world. She worried intensely. She had a neurotic predisposition, and she responded to this mental dilemma, not at the psychic but at the lowest level, as shown by a gradual creeping up of the hypertension, so that in the course of some years, when I first saw her, the systolic pressure was 260, and diastolic 140.

I had an opportunity of watching this case for four years. She died recently of cerebral thrombosis. In this case it seems quite possible we were dealing with a maladjustment at a lower level. Those who saw her before I did constantly looked for the organic focus. She had lost her tonsils and teeth. She had everything done in the way of elimination of foci of infection, with no result whatever.

Another case showing a temporary rise of blood pressure following mental disturbance was a man of 50, who had a very unfortunate domestic situation. He came to my office on one occasion after a serious dispute at home, very greatly perturbed. His systolic pressure on that occasion was 220. I do not recall what the diastolic pressure was, but it was low, comparatively speaking, as Dr. Greene has mentioned. When he came back two days later his systolic pressure was 140, showing, as has been mentioned, the very bizarre changes which may take place in blood pressure.

Another case which is of particular interest was a young man who was having his blood pressure taken for the first time. Ordinarily, in taking blood pressure, when the patient becomes excited he has a rise in blood pressure. I was busily engaged in watching the dial and did not look at the patient because I was afraid I would hurt him. When I saw the mercury begin to drop very rapidly, I looked around and found that he was falling over in a faint. His blood pressure dropped to 90. From that point it went down rapidly. He was lowered on the floor and his feet elevated until he recovered. It is important to remember that these emotional disturbances may, if long continued, become permanent.

Dr. J. F. Yarbrough, Columbia, Ala.—Emotional pressure and real pressure should be absolutely divorced. There is no relationship between the two. I want to report one case of real pressure because of its extraordinary character. A man's blood pressure had been running up to 245 (systolic) for a number of years until 1914, when he had a stroke of apoplexy, was completely paralyzed on the right side, and was in bed for three years. He reached our hospital several years later with complete paralysis of the right side, mental stasis, a systolic blood pressure of 240, with albumin and casts in the urine. In four weeks' time his pressure had fallen to 130. He had regained the use of his faculties, both mental and physical. He can now walk fifteen or twenty miles if he wishes to. His blood pressure ranges from 125 to 130.

You may say that if a man has been paralyzed for three years this is impossible. It seems impossible, but I have given you the facts in this case.

Our hospital records show more than a thousand cases of high blood pressure, of real hypertension, treated during the past ten years, or since 1912. We have not failed in a single instance to reduce the blood pressure. It usually falls to normal in from one to three weeks. It is done by diet and elimination.

Dr. Robert Wilson, Jr., Charleston, S. C.—I am very doubtful about the role of nervous states as a primary cause of arterial hypertension. Hypertension and arterio-sclerosis are very common among the non-emotional as well as the emotional. They are very prevalent among the negro race, who, although subject to emotional disturbances paroxysmally, are not subject to the constant nerve tension to which the development of hypertension is often attributed. In a recent rather remarkable discussion of the paleopathology of the ancient Egyptians, Ruffer points out that arterio-sclerosis in all its forms was as prevalent among the Egyptians 4000 years ago as it is today and that the same pathologic conditions were associated with it; while apparently these people were not subjected to the same emotional strain to which our modern high pressure life subjects us.

The etiology of hypertension is obscure and we are not in a position to be dogmatic. Where the primary change takes place is still a subject of discussion. It is probably in the arterioles or the capillaries, or in both, and to show that emotional disturbance is a cause of hypertension we shall have to demonstrate that these disturbances affect the arterial system or the capillaries in such a way as to produce a chronic obstruction to the circulation.

The treatment of the condition in my own experience has been very unsatisfactory, and I was much interested in the remarks of the last speaker, Dr. Yarbrough, who says that he gets such constant and such permanently good results.

With regard to the diet, as Dr. Greene has pointed out, the important consideration is not so much the kind of food as the quantity. Whether or not dietary indiscretions cause hypertension may be uncertain, but there is no doubt that in hypertension and in arterio-sclerosis dietary as well as emotional disturbances may produce serious symptoms. These patients often have cerebral accidents as a result of such disturbances, but there is not sufficient evidence to prove that these operate as primary causes of the process.

I was very much interested in hearing Dr. Gaines report a case of fall of blood pressure associated with fainting while using the sphygmomanometer. I have had a similar experience. One of my students upon whom I was demonstrating the use of the instrument fainted while his blood pressure was being taken.

Dr. Virgil L. Simpson, Louisville, Ky.—In the determination of blood pressure I like to put the patient under what I call basal conditions; in other words, to put him in the same condition with reference to rest, food, and so on, that we do when we are determining basal metabolism. If we give a patient fourteen hours' rest, without food, the blood pressure determination will give a fairly clear insight into whether or not the patient is suffering from transitory emotional or food disturbances. In determining blood pressures in my office or home I have the patient so situated that the instrument on the wall is at his back, and he does not know what is happening.

In patients with neuroses and psychoses the systolic pressure is exceedingly liable, while the diastolic is practically unaffected. In the aged, there is probably no question, aside from the possible rupture of capillary vessels in the brain, that a high diastolic pressure is of more importance from the standpoint of pathology than a high systolic pressure, but it must be borne in mind that a determination of the relative value of systolic and diastolic pressure is of importance. This brings us to a discussion of pulse pressure, which is the difference between the diastolic and systolic pressure.

It is of some importance to determine how much strain is being placed upon the arterial tree, and one should go a step further than the systolic and diastolic pressure readings and determine what the pulse pressure may be and also determine what is known as the heart load. By that I mean in the normal individual of given age, with a systolic pressure of 120, with a normal diastolic pressure of approximately 80, we would have a pulse pressure of 40. If we divide the pulse pressure by the diastolic we get 50 per cent or a heart load, which is normal. Determination of the heart load in another individual, who has a reading of 180 systolic, 120 diastolic, and 60 pulse pressure shows a heart load of 50 per cent also. In other words, this patient has a hypertension, but is functionally carrying the load as well as the normal case. The mechanism has been able to adjust itself and the heart muscle is doing its work well in spite of the strain put on it by a high systolic pressure and a high diastolic pressure. Suppose again another has a reading of 100 systolic, 80 diastolic and 20 pulse pressure.

This case shows a heart load of but 20 per cent. In this case the vasomotor tone is maintained in the vessels, but the cardiac asthenia needs attention.

High blood pressure readings, so-called, are not of themselves necessarily indications for a vigorous line of treatment with drugs. It is oftentimes a compensatory affair; it is oftentimes a thing which has grown up with the development of the condition, and vigorous efforts toward reduction may result in harm. Hypertension is no more an indication for treatment than is a valve lesion. It is often physiologic rather than pathologic. If the cause be a toxic factor it should be removed, but it is often due to essential factors, and its reduction interferes with metabolism.

Dr. Tom A. Williams, Washington, D. C.—The problem which faces this section with reference to arterial hypertension is, whether or not prolonged emotional stress is capable of inducing the picture known clinically as chronic arterial hyper tension. Otherwise the problem is one of internal medicine.

Cases have been brought before us in which it is alleged that chronic emotional stress has raised tension. The post hoc, propter hoc, there must be offset by an enormously large number of cases where there does not seem to be any special stress in the first place, and in the second place by the fact of the enormously large number of cases where great emotional stress fails to produce chronic arterial hypertension, and the number of cases in which great emotional stresses are present where arterial pressure is low. We neurologists see many of these. I see a great many cases where arterial tension is quite low in patients who for long periods of time are greatly disturbed emotionally. If there are so few relative cases where emotion seems to play a role, surely its role is not the effectual, the essential one, but the role of exciting cause which produces something else which is the essential cause of hypertension. What that is, is one of the problems of medicine.

It would seem from a considerable number of cases reported it is possible that protein intoxicants may be the efficient cause. Whether it is that an overload of protein substance in general can cause hypertension, or whether it is a specific protein which for that individual produces the syndrome, we do not know. Many patients who seem to be dieted in a satisfactory way fail to show improvement of symptoms or even fall of blood pressure.

Again, there are patients who are not dieting themselves when we suppose they are. An instance of that occurred to me last week. I have been looking after a doctor's wife who has this slowly increasing arterial hypertension. Her blood pressure has been well over 200 and has been gradually going up for several years, although she was not observed by me until two years ago. She was not sent to me for that, but principally on account of nervousness and some endocrine conditions. She developed sudden hemiplegia with hemi-anesthesia two weeks ago, and one of her chief symptoms was a clamoring for rare steak or oysters. This woman always assumed she had been dieting herself most carefully according to a regime, but I found out then that she had been breaking the rules persistently.

CONGENITAL SYPHILIS*

By Stewart H. Welch, M.D.,
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The writers' interest in syphilis in infancy and childhood is the result of the early realization of his own ignorance of the methods of recognizing it, rational treatment and adequate check as to cure. The conclusion was reached after ten years of observation that in this and many other localities this is the true status of many other practitioners.

Congenital syphilis has been passed down through medical generations and for the most part side-stepped by all types of practitioners, including many pediatrists and syphilologists. It is noteworthy in this Country at the present time that the literature of value is largely furnished by a comparatively few men and comes from a very small number of centers.

There are many things about syphilis that we do not understand. Certain observations that we must accept as facts appear to contradict each other. Many findings have no satisfactory explanations. Almost every phase of the disease furnishes a fertile subject for dispute. Uncertainty as to final cure is productive of much incurable syphiliphobia.

More than any other known disease, from early recognition to recent times, the accumulation of ever-increasing theories and laws have been true impediments to progress. Syphilis has served as the etiological clearing house or dumping ground for most of the unaccounted-for symptoms, symptom complexes, defects, abnormalities, etc. On the other hand, many symptoms and familial diseases depending on an underlying syphilitic infection have not been credited to syphilis.

A brief survey suffices to show the extent to which contributions from the laboratory predominate over those from clinics and practice. Relatively few clinical observations or contributions to symptomatology have been added other than statistics. While serology, chemistry, and pathology offer wide fields for research,

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our present status is most unsatisfactory. The Wassermann test and its modifications today are regarded as non-specific, and they are of less value in congenital lues than in the acquired form.

DeBuys reports in one hundred and six Wassermanns taken in a foundling institution, one hundred per cent gave a negative Wassermann. However, many of these children had had mercury and iodid for a varying length of time. It is an accepted belief that illegitimates have a higher percentage of infection than legitimates. Seventy-six Wassermanns taken at the age of two or three weeks on my service at the Salvation Army Rescue Home in Birmingham were one hundred per cent negative. Placental bloods correspond in like number of tests taken, the exception being in a small number of waifs. One of these mothers had received intensive ante-partum treatment and her vein and placental blood Wassermanns were negative. Her baby, a mild type of microcephalus, failed to make progress until given treatment. Two others gave the history of "three shots," supposedly arsphenamin. One mother reacted four plus to the first antigen and two plus to the second antigen. Both babies desquamated profusely, including their palms and soles, and failed to make progress. The one in which the mother's blood was negative showed rhagades. Another, a waif two and one-half months, developed a most intense activity.

Though the Wassermann reaction is of value, it is frequently most vexing and puzzling, particularly in the congenitally infected. Fordyce and Rosen, using cholesterinized antigen, estimate 25 to 35 per cent of strongly positive Wassermanns in pregnant women who in several weeks after delivery became negative, and remained negative to repeated retests. Solomon and Solomon found a higher rate of positive reactions in mates than in offspring; 30 per cent of spouses were positive as compared with 4.8 per cent to 16.7 per cent positive in infants. Fournier gives 84 per cent maternal positives against 37 per cent paternal positives as a congenital factor. It is common experience that an infected infant may not develop a positive reaction for several months.

Except in the hands of a few, luetin has not met with general favor. However, the writings of DeBuys and Sholl are instructive. Their conclusive findings give value to the test and the former considers it of more value than the Wassermann in congenital syphilis. Flocculation and chemical tests are seemingly multiplying, and some are taking their places as adjuncts of worth. They have not come into general use.

According to Hess, conservative figures place 8 per cent of the population in the luetic class, which means eight millions in the United States. Many more people have unrecognized lues as a result of family contact. Williams, in a series of ten thousand pregnancies, found 20 per cent to 50 per cent of abortions are due to syphilis. In seven hundred and five fetal deaths syphilis was the cause of 34.4 per cent. The Johns Hopkins Hospital places the luetic deaths at 24.4 per cent. Morgan, of the Toronto Hospital for Sick Children, in seven hundred and twenty-five admissions found 4 per cent syphilitic. Solomon and Solomon, in a study of five hundred and fifty-five families of late syphilis, found that 23 per cent were entirely sterile as compared with a like series of supposedly non-infecteds of 11.8 per cent; 29.7 per cent of his series gave birth to no living children, and 6.7 per cent resulted in unsuccessful pregnancies. Kaufman-Wolf and Abrahamson report their fifth series on "Hereditary Syphilis" as a cause of death. The total mortality was at least 70 per cent when the mother was infected and under all conditions 50 per cent. The morbidity of the living averages 50 per cent, so that only 25 per cent of children in one hundred and thirty-four families grow up healthy.

It is neither the author's desire nor intent to attempt a discussion on the manner of transmission of hereditary syphilis. The accepted fact that maternal, or more accurately, placental infection classifies this type of congenital syphilis as an ante-natal infection, divides it into stages as in the acquired form, and places therapy on a logical basis.

The placenta as a whole acts as the primary focus. Probably through active local phagocytosis this focus usually is free from organisms. On the other hand, the viscera of the fetus may be swarming with spirochetes. As a rule, organisms are found in numbers in the fetus. Certainly the havoc wrought by the spirochetes in the developing tissue, organs, and the fetus as a whole plays a tremendous part in the outlook for the future of infants who present themselves for treatment. This is in accord with the statement of Hendry, that is: "When treatment is begun during pregnancy the prognosis of the fetus depends on the unknown degree of the infection already in the fetus." Routh expresses the opinion that if unrestricted infection has been going on in the ovum or the fetus, rapid destruction results in spite of treatment.

Activity of infection in the ovum or in early fetal life terminates in its destruction in almost every instance. Jewesbury found that treatment begun after the seventh month did not prevent the birth of a syphilitic infant, though subsequent treatment and cure was effected more readily. The majority of those in whom treatment is started not later than the fifth month, have children free from syphilis. Williams advances the hope that future congenital syphilis may be eradicated in clinics in which mothers register prior to the middle of pregnancy.

The writer feels that if we can ever get sufficiently away from hereditary theories and taints even in the second and third generations, to say nothing of more distant effects in the fourth and fifth line of descendants, we can at least place that portion of the disease on a possible and more rational basis. If there really is anything to maternal transmission, we can define this form of hereditary syphilis as an ante-natal infection. We have then to deal with syphilis acquired by the fetus from the infected mother. There can be no question that the infected infant is entitled to and should be given the benefit of the same considerations which are given to acquired syphilis of later life. Fairness demands that specific drugs and drugs of adjunct value be selected and administered to them by such methods as the activity of the disease indicates. The problems confronted are: first, the selection, dosage, and interval of repetition of the drug and the choice of method to be used along with the difficulties of administering it; second, the undeterminable damage already done, much of which may be beyond repair; third, and equally important, is the infant itself, its nutrition and progress; fourth, the heedless lack of interest and persistence manifested by parents.

That drugs may be used beneficially has been repeatedly demonstrated. If any selected method is indicated in acquired lues of adult life it is just as necessary in infancy. The end result of destroying active and dormant spirochetes is the same and just as essential in one form of the disease as in the other.

Granting results of White and Veede's study, "The infant mortality rate is three times the rate for infants from other diseases. This is in spite of treatment and seemingly dependent on the extent to which the infant's nutrition and metabolic functions have been impaired." It is not indicated whether this is dependent on the ravages of the disease or the ill-effects of treatment. However, we know that there often are ill effects from the treatment which often give more concern than the therapy.

Feeding of the normal, averagely normal, below par, sick and well infants, while of least value from a monetary point of view, makes the specialty of pediatrics possible. The writer cannot conceive of the rationale of the care of syphilitic infants without the essential pediatric care.

The statements of Vecki are concise and interesting. He says that syphilis is a comparatively easily curable disease, that all patients can be cured. The stamping out of syphilis will be made possible when proper treatment shall be easy of access, easy to take, and it is made easy for every one to find out whether he has syphilis or not. He classifies syphilis as an infectious disease, but abhors compulsory reporting to the health authorities. He terms anti-syphilitic remedies as dangerous weapons in the hands of the majority using them.

When we apply these statements, particularly in congenital syphilis, the cure is very much influenced by: the general condition of the infant; the more likely intolerances of the infant; the tardy convalescence following upsets; the already present irreparable damages to tissue and organs; the difficulties of administering the remedies; and very inadequate methods, either clinical or laboratory, of diagnosing the disease or its cure.

The classification as an infectious disease places syphilis as the legitimate property of health authorities since infectious diseases are reportable.

The writer feels that the therapy in congenital lues can be more sanely administered when the interested pediatrist educates himself to the best of his ability and then, closely associated with the syphilologist, renders joint service to the infected infant.

Congenital syphilis is most truly a public health and social problem. Peter, for example, followed one thousand patients treated for venereal disease at free dispensaries, and he draws a gloomy picture of the heedlessness and lack of perseverance of the great majority. He found that severity of symptoms at onset had very little influence. The familial aspect is almost without bounds and transmission by the infected goes on without concern. Mothers receive treatment or return with babies and children until the disappearance of symptoms or until apparent health.

No clinic or private practice is complete without a follow-up system. Even an excellent follow-up is often ineffective. My nurses rather frequently tell me, "I must go for them in the car or they will not come." The negro race is oftentimes more readily herded in than the whites. This is not so much through interest in the cure, but simply due to the fact that they are more readily driven. State, county, and municipal venereal clinics are reporting that fresh infections are noticeably on the wane. Those of us who lean to the belief that eradication of a disease depends on prevention rather than the treatment of the disease accept the claim with some misgivings.

Williams hopes for the eradication of congenital lues through the proper recognition and care of the expectant mother. This should be a stimulus to the obstetrician and a boon to the pediatrist. Truly one of the greatest problems before us is the apparently healthy or near healthy child born of a treated or untreated, infected or questionably infected mother, with 25 to 35 per cent strongly positive Wassermanns in pregnant women who are and remain free from symptoms and whose blood fails to show positive reaction after delivery. With 20 per cent of mothers of infected infants free from symptoms or evidence of syphilis having negative blood reactions, the difficulties of fairly arriving at conclusions is evident. Truly we must turn to the laboratory for more convincing and reliable help.

Syphilis is no respector of class. The writer divides the infected into two classes, those who are and those who are not clinic material. Into the first group he places those whose financial status or financial promise classifies them as private practice cases. They are not clinic material. Those who classify as clinic material he again divides into two groups: first, the poorer whites and negroes who make up the bulk of all free clinics; and second, he attempts to care for the heretofore unprovided for lower middle class.

Luetic therapy in its modern application is very costly, in many instances much too costly. There are many of the financially less fortunate who are truly worthy of free clinic service or care at a nominal cost.

Realizing that this is a true status, the writer was readily interested in our State Health Officer's statement that there are many venereally infected indigents who could not be induced to come or to be brought into venereal clinics. Some are able to pay a nominal fee and desire to pay. There are certain of the poorer whites, certain institutional children, who truly have no place in a general white and colored free dispensary. With this conviction as a basis, we are attempting to carry on two clinics. For the class just described two periods weekly are given in which selected white congenital cases may

be brought to my office and receive medication furnished by the State and for which a nominal fee per treatment is paid out of the State fund or a like amount is paid by the patient. The patients are selected usually by the Juvenile Court, Children's Aid Association, the Welfare Department of the Health Department, the Anti-Tuberculosis Association, the Salvation Army, orphanages, and other institutions. Since all these sources have nursing forces, the nurses are held responsible for the subsequent treatments and follow-up visits on cases brought from their organizations. The few cases which come in from the outside are taken over and cared for by one of these organizations. Thus far the clinic has been fairly satisfactory and is growing in numbers. The cost of conducting it is fairly well covered by the State.

The general free congenital clinic is conducted as a separate department of the State and County venereal clinic. The actual work is largely done by one of their staff and the writer, in this manner: the idea of joint service of the syphilologist and pediatrist is carried out. The cases are cared for by nurses from the nursing department of the city and the county. This clinic maintains close relation with the general children's clinic. Both clinics are in their infancy and time is required to prove their value.

Rarely do we see alimentary therapy carried out to a reasonable cure. Usually it is continued until the infant develops intolerances and here often the retrogression is in excess of the gain. Mothers are too prone to stop with apparent health, and the case is too often lost to the physician so long as it is not truly ill. Less can be said of mercury ointment. The mother soon wearies of the dirty rubbings and a filthy offspring. The writer has not hesitated after the first few weeks to order as much as 90 grains rubbed in for forty minutes in a baby of nursing age every alternate day and has yet to see ill effects. He feels that you can be reasonably assured that the rubber will reserve her energies. She tires of the loathesome job. Mercury inunctions are absorbed in widely varying degrees. They are of value in selected cases. They should be rubbed briskly over wide areas for thirty to forty minutes, then the baby cleansed with soap and hot water or benzine. Mercury salicylate is an excellent drug, but its continued intramuscular use means that your patient does not continue to come back. These drugs have their place, but should not be depended on over long periods. The writer finds, too, that intramuscular neo-arsphenamin, if repeated too often, may give very unwished-for thickenings.

Mercury, regardless of efforts to dislodge it, continues to hold its place as the truly specific drug and fundamentally must be a part of our therapy. Mercuric chlorid, because of its effectiveness and small cost, even though it be a possible cause of protein in the urine (White) must, for the present, predominate in clinic uses. The iodids should not be forgotten in our therapy.

It is wisdom, when activity and infectivity indicate, to use the intravenous route until the control makes it selective as to whether you continue this method or choose another.

That all standard methods of administration and many of the accepted drugs have their application seems rational. When all is said and done, the therapy which gives the best results is the therapy which is administered by the physician at proper and effective intervals.

In a series too small for conclusions of real value, we have used mercurosal, disodium - mercuri - salicyl - acetate intravenously and intramuscularly with seemingly gratifying results. The drug is readily soluble and is well tolerated by the infant. The local reaction in the vein is a slight thickening of the wall, permitting repeated use of the same vein. The burning sensation when given intramuscularly varies, and as a rule is of very short duration if the injection is truly intramuscular. The induration is usually negligible. Active symptoms ameliorate and the blood Wassermanns are seemingly satisfactory. It can be given in large doses without the ill effects of salivation, gastrointestinal upsets and usually without evidence of kidney irritation. The figured dose per pound may be doubled for the initial administration and increased to effect.

On this basis we give ten to fifteen injections by either route, or beginning intravenously control the more active symptoms, then complete intramuscularly. Without interruption of the series three to six neo-arsphenamins are given. The mercurosal intravenously is given in three- to five-day intervals, intramuscular every five to seven days, and neo-arsphenamin is given weekly between the mercury doses. The cost of the drug prohibits it from general clinic use.

CONCLUSIONS

(1) The present laboratory procedures are inadequate. Further progress apparently depends upon more reliable laboratory assistance.

(2) Therapeutically, congenital syphilis demands every consideration given to acquired syphilis. Activity and infectivity demand active treatment by the route indicated by the degree of activity and infectivity present.

(3) The practice of intelligent obstetrics is important in minimizing irreparable damages for the subsequent treatment and for the possible prevention of congenital syphilis.

(4) Intelligently administered, pediatric care is as essential to an infant infected with syphilis as is mercury.

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DISCUSSION

Dr. W. L. Funkhouser, Atlanta, Ga.—Children borne of syphilitic parents may show at once the evidences of syphilis, with either a positive or negative Wassermann, or there may be delayed manifestations of syphilis. It is estimated that 12 per cent of the inmates of our clinics, 4 per cent of our private patients, and 5 per cent of the inmates in our institutions have congenital syphilis. It is only by such cooperative study as Dr. Welch has carried out that we can obtain accurate statistics. We have tried to do this in our Clinic by grouping our syphilitic cases and cooperating with the prenatal clinic. As soon as a mother is admitted to the Clinic a Wassermann is made. If it is positive she is referred to the clinic for the treatment of syphilitic pregnant mothers. When she is delivered a Wassermann is taken from the cord, which usually corresponds to the Wassermann on the mother. It is not unusual, however, to see a negative Wassermann in the mother and positive Wassermann on the cord. Just before the mother is dismissed from the hospital the baby is entered in the clinic for examination and treatment. Our routine treatment at present is to give the younger children 1/10 of a grain of bichloridol of mercury and the older children ¼ to ½ grain of salicylate of mercury intramuscularly every other week for eight weeks. On the alternate weeks they are given neo-arsphenamin 0.5 or 0.4 gram intravenously. If we cannot give it intravenously we give it intramuscularly. After an interval of one week following the first series of treatments a Wassermann is taken. If it is negative three months' rest is given on mixed treatment, then another Wassermann is made. If negative a provocative treatment is given and if the Wassermann is again negative the patient is allowed to rest for three months. If positive after the first series an additional series is given, followed by three months' rest on mixed treatment. After the first series we have been getting 22 to 25 per cent negative Wassermanns, but they do not all stay negative. About 14 per cent relapse. As Dr. Welch states, it is necessary to see that the child has good nutritional food and proper hygienic management.

Dr. J. H. Mason Knox, Jr., Baltimore, Md.—I would like to say just a word, not on the treatment of syphilis, but on its importance as a communicable disease and especially upon its importance to pediatricians. The claim upon the community can be expressed from the standpoint of the baby. In this field as well as in the larger field of child health work, we must educate the people.

In this line are needed more real specialists—not so-called specialists, but men who know syphilis in its unusual forms, men who can make a diagnosis of unusual cases and men who know how to adapt the treatment to such forms of syphilis so as not to harm the individual. A great deal of harm is being done by people who think they know how to treat syphilis.

Dr. Osler said that if we knew syphilis we knew all internal medicine. Though we know how to differentiate the indefinite lesions of syphilis from other diseases, it takes six months at least of intensive work in clinics to make a man who may be a graduate, and who may be a specialist, proficient in this line. It is a tremendous problem. I have had repeatedly in my office, as have other pediatricians, cases with congenital lues whose parents told me that they were told by physicians that they could marry without danger. I believe thoroughly in health marriages, that there should be no contraction of that sacred obligation until the man and woman have first submitted themselves to a qualified institution or to a qualified physician for examination.

Dr. N. C. Womack, Jackson, Miss.—Congenital syphilis is universal in its incidence. It is more than a health problem. It should be dealt with by public health officers and doctors as well. It is up to the pediatrician primarily to bring it to the attention of the profession and to cooperate with the public health authorities. It is a disease that is more protean in its manifestations than anything else I know. I sometimes think the statistics of its incidence are too low, that it is higher than 8 or 10 or 12 per cent. By positive Wassermann, spinal fluid, and blood examinations, and clinical manifestations, the symptoms are so apparent that the diagnosis can not help being made. The question goes beyond the scope of the pediatrician. The disease primarily must be dealt with by the man who deals with the mother before the baby is born. It is a slow process, but we must educate our mothers to the occurrence of syphilis, and we must tell those mothers when we find a case of congenital lues in a baby. That the examination of the baby is never complete until the question of congenital lues has been eliminated is evident from the fact that in one family five of seven members showed no evidence of congenital lues, and one baby did. Examination of the family and the clinical history of the family was entirely negative, and yet here was a child showing evidence of being chronically ill and having a positive syphilitic reaction.

The question of treatment is not medical altogether. It is the question of taking the parents into one's confidence and teaching them what the disease is and where it came from. It did not come from the mother or from her husband, because they are both negative, but came from further back, possibly four or five generations. The mother should be made to understand that it takes a long time to treat the disease. I do not know that it is ever cured. I know that a large percentage of the cases that are treated for years will ultimately show a positive reaction. It is a question of educating the people.

Dr. Arthur G. Jacobs, Memphis, Tenn.—One of the most interesting features of congenital syphilis is the mode of infection. The father is usually the infecting parent. If you look up the various authorities on congenital syphilis today you will find the statement frequently made that the spirochetes are found in the spermatozoa and in the ovum. Recently Miller, of London, brought forth the view that it is impossible for as large a body as the spirochete to enter the spermatozoan and it certainly could not live there. If the father is the infecting parent the semen is the source of infection, so there is no doubt that if this were carefully investigated we should find other constituents of it which are probably the infecting medium. That point is very interesting.

Regarding treatment, what is the relative value of arsphenamin and neo-arsphenamin? Is it not true that we have seen a good deal of neuro-syphilis in those who have had arsphenamin and neo-arsphenamin treatment? You find that some of the specialists on the treatment of syphilis, practically all of them, combine arsphenamin treatment with mercury. They are not exactly sure of their ground and think it is wise to use the two. Much work should be done before we have a proper conception of congenital syphilis.

Dr. Welch (closing).—The dosage in syphilis must be safe, and it must be effective.

It is my idea in the clinic described to cooperate closely with the pre-natal and children's clinics, and especially with the County Venereal Clinic. The State health officers and the County health officers have agreed to cooperate with me. In return for their help I am to try to give these children not only treatment for syphilis, but also pediatric care. The cases ought to be handled as the case individually indicates. If there is an indication for intravenous injection it should be given. The point brought out by Dr. Knox is of prime importance.

I refuse to go into theories with reference to the spermatozoa and spirochetes because I do not feel capable of discussing them. Jean has done probably as good work as any one on congenital neuro-syphilis. There is probably no disease that is more responsive to treatment than syphilis.

ULTRA-VIOLET RAY THERAPY IN DERMATOLOGY*

By Jack W. Jones, M.D.,
Atlanta, Ga.

The medical profession has become extremely skeptical of the curative value in disease of anything that can be "turned on." This is due, in a large degree, to the fact that these agents have been commercialized. The manufacturers, in the hope of making as much money as possible from their products, have made so

*Read in Section on Dermatology and Syphilology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

many extravagant therapeutic claims which cannot be substantiated as to cause the physician to think that they are all worthless. For this reason, physiotherapy has been, until recent years, the stand-by of the quack and faker. The recent war has done as much as anything else in placing physiotherapy in its proper place in the physician's armamentarium. We are now beginning to realize that there is a place for it in medicine if it is used properly as a therapeutic aid and not as a general panacea for all disease.

Ultra-violet ray therapy in certain forms is almost as old as medicine. Our professional brothers among the ancient Egyptians and other races exposed their patients to the sun's rays in the treatment of various diseases. The first perfected effort to get a sunbath by going above the dust, etc., was when Rolier, of Switzerland, established sanatoria at an altitude of four thousand feet. Finsen, in 1891, was first to demonstrate in a scientific manner the value of the ultra-violet rays. At present there are a number of ultra-violet ray lamps on the market which are practical for every-day use. The modern ultra-violet light apparatus furnishes a radiation approximately four t mes richer in ultra-violet rays than the average sunlight. The two types of lamps we have at present are the air-cooled and the water-cooled. Their essential difference is that the heat of the air-cooled lamps vaporizes the mercury and the shorter wave lengths are absorbed by the vapor; whereas, the water-cooled lamps condense this mercury vapor and these rays are given off.

The therapeutic value in dermatology of the ultra-violet rays depends upon the bacteriological and stimulative action. According to Puccini, the water-cooled lamp with its shorter wave lengths exerts the more marked bacteriocidal effects, while the air-cooled lamp is indicated for systemic effects. Various observers have exposed both bacteria and fungi to the ultra-violet rays and found that they were destroyed in a relatively short time. Their action upon the skin is manifested symptomatically by an erythema of the part exposed. Thus, a stimulative erythema, a regenerative erythema or a destructive erythema can be obtained, depending upon the length of exposure. Their action upon the blood stream and general economy is still more or less theoretical.

TECHNIC

The technic of using these lamps depends more or less upon the individual operator. At present there is on the market a blue paper, sensitized to the ultra-violet rays, with which a supposedly standard unit can be computed. I have not found this entirely satisfactory. In giving these treatments it is well to keep in mind a few standard rules to be governed by, viz: blonds react much more quickly than do brunettes; and covered portions of the body also react more quickly than uncovered portions. In general, the more an individual tends to a dermographic skin, the quicker will be the reaction. My general scheme of treatment is about as follows: for a stimulative erythema in general radiation, I place the part to be exposed about fifteen inches from the burner and use for the first treatment a three- to five-minute exposure, protecting the surrounding parts with a cloth. For radiation under pressure, I usually begin with a two-minute exposure, gradually increasing the next exposure, being governed by the individual reaction of the patient. Treatment should be repeated when the primary erythema subsides.

THERAPEUTIC INDICATIONS FOR ULTRA-VIOLET RAYS IN DERMATOLOGY

Practically all dermatologic conditions have been subjected to the ultra-violet rays at one time or another. It is not my intention to discuss the mass of literature upon the subject, but only the cases in which my personal experience seems to warrant the use of the rays.

Scalp Conditions. — Scalp conditions, more so than any other part of the integument, seem to react favorably to the ultra-violet rays. In seborrheic dermatitis or alopecia prematuro from seborrhea, the ultra-violet rays, with their bactericidal and stimulative actions, become a very valuable agent in treatment. The exciting cause of this is certainly bacterial in origin. If we have an agent which is

both bactericidal and stimulative in its action, theoretically it is the agent to use. Practically, the results are very good, the time element being its only drawback.

Alopecia Areata.—Personally, I have never seen a case of alopecia areata which would not respond to the ultra-violet rays. The action here, in my opinion, is purely a stimulative one and practically as good results can be obtained by the use of stimulating drugs. The advantage of the light is its cleanliness and ease of application to large surfaces.

Psoriasis.—It is well known that psoriasis will clear up temporarily if the part affected is exposed to the sunlight. The ultra-violet rays have the same effect, being particularly useful in psoriasis of the scalp where the x-ray is impracticable.

Naevus Flammeus, or Port Wine Stain. Recently, a number of observers have published papers and cases reporting very successful results with the rays in these cases. I have used it in only two cases. In one the results were fair; in the other very good. This type of treatment by the compression method promises the best results of any method we have at present, as there is no scar following the treatment. Even if we do not get a brilliant result, at least, we have not disfigured the patient any more than he already was.

Lupus Erythematosus.—In lupus erythematosus, particularly of the chronic discoid type, the ultra-violet rays show results as promising as those of any method which we have at present of combating this disease. Their action here, to my mind, is purely a stimulative one. Here again, as in alopecia areata, the primary focus, be it tuberculous or otherwise, must receive attention. I have seen several cases, previously treated with radium and other local applications without appreciable benefit, respond very nicely to the ultra-violet rays.

Adenoma Sebaceum.—In this rather rare condition, the rays are about the only therapeutic agent upon which we can place much dependence. Here I have used both the compression method and open radiation and find that a regenerative erythema dose with compression gives the better results. I have noticed in the literature only a very few cases treated with this method, but with uniformly good results reported.

Parapsoriasis.—Although I have not had occasion to use the ultra-violet rays in this condition, I cannot refrain from giving it mention on account of the many favorable results reported in the literature. All who have had occasion to treat parapsoriasis in any of its forms know of the difficulties experienced in attempting to treat it with local applications. If the favorable results reported in the literature are true, and I have no reason to doubt them, then we certainly have a form of treatment in this disease more promising than any other type of treatment that has been tried.

There is only one other type of case which I wish particularly to discuss, and this is the chronic sluggish ulceration caused by trauma or infection, in which epithelium seemingly refuses to grow. Most of us, at one time or another, have seen such cases. The following is a very good illustration:

D. B., a male, age 12, referred by Dr. Hoke, came into my office January 12, 1922, and was entered with a diagnosis of dermatitis traumatica. The following history was obtained: eight years previously he developed an osteomyelitis in the left leg. He was operated upon several times by different physicians and treated in various ways, until sixteen months before presentation, when he came to Dr. Hoke, who operated upon him for the same condition. Seven months after operation he was sent home with the leg entirely healed. It remained in this condition for about seven months and the boy was apparently leading the normal life of a school boy.

Following a slight injury, a sore developed on the old scar tissue and despite treatment two more formed. All of them refused to heal under the usual type of treatment. When I examined him, there were three lesions over the tibia, extending from the middle of the lower left leg to the ankle. These lesions were about the size of a quarter. The lower one was draining some pus. The upper lesions showed unhealthy granulations, a bluish color and numerous crusts scattered around them. The skin and scar tissue around them were very thin and resembled parchment. X-rays of this leg by Dr. Hoke showed nothing pathological. Routine laboratory examinations were negative. The boy's general condition was good. He was started on daily radiation with the ultra-violet rays, ranging from one and one-half minutes the first day to eighteen minutes during the latter part of treatment, with a fifteen-inch distance. The lesions began to show improvement after the

fourth day. After the first ten days, treatment was instituted every second day. On the twenty-eighth day, the lesions were healed. The epithelium covering the scar tissue was firm and looked as healthy as the skin on the other part of the leg. The leg showed a good coat of tan from treatment and the bluish red color had disappeared. The patient was discharged on the thirtieth day and advised to expose the leg one hour each day to the sun's rays. From last reports the condition has remained well and the skin seems to have regained its healthy tone.

Ultra-violet ray therapy in dermatology is as yet in its infancy. There are many things to be learned and problems to be worked out before its final place can be assigned, but enough has been learned to show that it has at least a place as a therapeutic adjunct in the dermatologist's armamentarium.

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DISCUSSION

Dr. William Allen Pusey, Chicago, Ill.—I have been using the water-cooled quartz lamp for several years. The method of treatment has not in my hands proved of very wide usefulness. I use it more frequently than any other agent in the rare cases of lupus vulgaris that I see. I use it frequently in alopecia areata, and in this it is probably our most useful method of treatment. I also use it occasionally in chronic inflammatory dermatoses that I think need stimulation. Of the dermatoses of this sort I have found it most useful in patches of lichenified skin, the so-called neurodermites.

Dr. J. M. King, Nashville, Tenn.—In one instance in which I had the ultra-violet ray used for an x-ray telangiectasis, about two inches square on the neck, a Kromayer lamp was used, and it failed to give any relief. I touched the telangiectasis with a very mild current with the needle and that gave better results than anything else. The Kromayer lamp utterly failed. I saw the case not six months ago and it was as bad as when she presented herself to me. So I have not had much confidence in the use of the ultra-violet ray.

Dr. S. F. Casenberg, Knoxville, Tenn.—Every case of telangiectasis can be cured by the ultra-violet rays. I have not seen a case in four years that did not respond, regardless of its severity. But you cannot cure a case without pressure. The same technic exactly is used in birthmark. Destructive erythema and pressure have cured all the cases I have seen.

Dr. Everett S. Lain, Oklahoma City, Okla.—I have been using ultra-violet light for about eight or nine years, first in the form of the air-cooled light and later have also used the water-cooled light. Their values are practically the same, but their convenience differs as regards surfaces. The deep or intensive action can only be given by pressure with a Kromayer or water-cooled light.

My experience in the treatment of naevus vascularis has been that the light is not so valuable as other agents such as radium or carbon dioxid snow.

The treatment of lupus erythematosis with only a mild reaction may make it appear worse, though if you push to an intense reaction you get excellent results.

In alopecia, everyone has had good results. In the treatment of x-ray telangiectasis I have seen good results. Some cases seem not to respond at all. We usually later resorted to other means such as the electric needle or fulguration.

I think that this agent has come to stay, and that it behooves us to report from time to time upon its value until we have reached more definite conclusions about the matter.

Dr. Thomas W. Murrell, Richmond, Va.—My results with the ultra-violet ray in acne have been very disappointing.

One thing in which I have used it with good results is in itching of lichen planus. It seems to have an anti-pruritic effect.

There is a temptation to use this light in various conditions and I hope to find out here when not to use it, as well as when to use it.

Dr. A. L. Glaze, Jr., Birmingham, Ala.—My experience with the ultra-violet ray is that it is a wonderful way to impress the patient and a difficult way to cure what can be cured by simpler means. It smacks strongly of charlatanism, and at least a large part of what popularity it has may well be ascribed to the enormous advertising its promoters have sponsored.

Dr. J. B. Shelmire, Dallas, Tex.—In extensive chronic itching dermatoses, by the use of the ultra-violet ray, I have allayed the itching and helped the patient to get well.

In alopecia, especially alopecia areata, I have done some good and have impressed the patient. It does no harm, I am sure, and sometimes we get good results.

Dr. Cosby Swanson, Atlanta, Ga.—I have used ultra-violet ray both with air-cooled and water-cooled lamps.

In the beginning of my experience I tried the lamps upon nearly every condition, even scabies. I now limit its use to a very few conditions.

It is beneficial in psoriasis of the scalp and body, but in psoriasis of the body the x-ray is the better agent.

It is beneficial in clearing up many cases of lupus erythematosus, especially the dry, scaly, superficial type that has become chronic. It is most beneficial in the treatment of alopecia. I depend upon it almost altogether in the treatment of alopecia areata.

The ultra-violet ray has a very limited field.

Dr. S. F. Casenberg, Knoxville, Tenn.—It took twenty-five years to establish the standardization of x-ray technic, and there is wrangling among x-ray therapists now as to proper dosage. The ultra-violet ray is much younger, though it was first used twenty-five years ago. It was only when the mercury vapo lamp came out that we had any ultra-violet ray worth while, and there is much to be learned yet in regard to it. I have been following for two years the technic laid down by A. J. Pacini and Howard Plank, and my experience has been almost the reverse of that of the two gentlemen who have just expressed themselves.

Dr. Lynne B. Greene, of Kansas City, a dermatologist of considerable note, told me that he had discarded x-ray equipment entirely for the ultra-violet ray in dermatology. He exhibited in Kansas City in April a number of cases of birthmarks and asked if any of those present could tell on which side of the face the birthmark had been, and none could tell. In two years I have not failed to cure a case of telangiectasis, that is, I have caused to disappear all the evidence of telangiectasis.

There is another thing which I have learned in the last twelve months, which was first brought out by Major Chris M. Sampson, of Fox Hills Hospital, Staten Island, N. Y. By using the ultra-violet ray as a preparatory treatment of a skin surface that is to be treated by the x-ray, you can increase the dose of x-ray I do not know how much. Dr. Sampson says 220 times. Personally, I have given 100 per cent increase with no reaction. On the other hand, if you try treating a case of eczema, or any other dermatological disease, that has been treated with x-ray before, it will take eighty to one hundred times as much ultra-violet light to produce the slightest dermatitis. The same thing holds good in any other condition. If you want to give massive doses of x-ray, treat your patient first with the ultra-violet ray.

Of course this massive dose should be preceded by a course of ultra-violet given every day or every second day until you have produced a dense brown pigmentation of the skin.

Dr. Jones (closing).—When I first started to use this light, I had heard so much against it and so little for it that I believed it was no good. The better my technic becomes, the better results I obtain.

I never use ultra-violet ray in acute lupus, but only in the chronic discoid type. I rarely see lupus vulgaris.

My results with the rays in acne have been very poor.

The only type of case in which I wish particularly to impress upon you the desirability of using the ultra-violet ray is the chronic ulcerative case, which does not heal under ordinary medical treatment.

FURTHER OBSERVATION IN THE USE OF HIGH VOLTAGE X-RAY*

By Robt. H. Millwee, M.D.,
Dallas, Tex.

It was my privilege last year at Hot Springs to talk to you briefly regarding the use of high voltage x-ray, and more particularly to outline to you the impressions gained while observing the use of high voltage x-ray as practiced in European countries.

Many times since I have been asked the question, "Are you as enthusiastic about high voltage x-ray as you were last year?" I am more enthusiastic. When I talked to you last year my own experience in the use of high voltage was limited to a few months. During the past eighteen months we have treated three hundred patients.

The technic of high voltage x-ray therapy is not yet perfected. There are so many important technical points to be considered that to discuss thoroughly even one of them would require more time than is allotted to me. Since I have been confronted with many practical problems in the actual applications I am more inclined to discuss with you the status of high voltage therapy as I see it, based upon my own experience and the observation of others.

The problems confronting us in the use of high voltage or short wave length x-ray therapy may be divided into two groups: the physical and the biological. High voltage x-ray and the modern technic of application practically solve the physical problems of radiation therapy. The matter of dosage seems to be the most important one, at least one of the things that most of us are thinking about. There has been much discussion regarding the erythema dose and the question is often asked, "What erythema are you talking about?"

When using the penetrating ray produced by two hundred thousand volts filtered through copper, we seem to have a great latitude of dosage so far as the skin reaction is concerned. We find that we

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may give a sufficient amount of this ray to secure a slight erythema, and then we may give just as much more without permanent damage to the skin. So far as the danger to the skin is concerned we seem to have much greater latitude of dosage than when using the x-ray of a longer wave length, or lower voltage. We are inclined to think that this is the case with other tissues of the body when we attempt to deliver a dose to the tissues underlying the skin, particularly if large fields are used to secure a more even radiation. We have formulated a plan of determining the amount of radiation required to produce a slight erythema, and then we use just 50 per cent more than this amount. And we term this "an average erythema." That is, with a certain technic we receive a slight erythema in two hours. We then give three hours and call this an "average erythema."

Skin reactions are the least of our troubles. We have attempted to measure our patients before treatment and to administer the dose through as few portals of entry as possible in order to give the proper dose to the tissue which may be affected, and in most cases we have tried to give as a dose to the deep tissues a hundred and ten per cent of the "average erythema dose." We have not invariably attempted to give this same dose to every patient, because we have always found it advisable to take into consideration the general condition of the patient, or rather the requirement of the case. The matter of dosage will never become an automatic one, so that each and every patient receives the same dose. We do not find this in other medication. We do not find the surgeons carrying out this program. Why should we expect it of the radiologists?

I shall not attempt to give you the details of our technic now, because it is not yet perfected. The modern method of measuring the x-ray by ionization is sufficiently accurate, with the use of common sense and a little care in our measurements and application of the dose. If we record carefully all the factors used in giving the dose, such as the measurements of the patient; the size and number of the fields given; the voltage and the amperes and the time with filter and the distance, they will be very valuable data for the future.

Of the 300 cases treated, which have covered malignancy of almost every part of the body of which we have malignancy, the larger portion have been of the pelvis, the cervix, the prostate gland, the breast, the neck and the face. It would be impossible to describe to you in detail the results in any one given case in this length of time. It is not practical to try to describe the effects of administration of a large dose in each and every part of the body, but we have observed some things or some symptoms which have occurred after giving this treatment in different parts of the body which it is well to mention.

As a rule, we have had no trouble with skin reactions. The skin reaction from a single large dose clears up very rapidly and after eighteen months no ill effects have yet occurred in our cases. In treating pelvic cases we have the ordinary diarrhea and cystitis, but not so much now as occurred with the old technic. The most interesting symptoms we have had have occurred in patients who received large doses about the neck and head. We have had, I think, 13 cases of carcinoma and sarcoma of the throat and neck, cases where the glands of the neck were carcinomatous. A number of these were carcinoma of the tonsil. The original lesion was in the tonsil. We tried to administer a full dose through all the tissues from the brain cavity to the thorax, using two fields of entry. One evidence which we have outside of our measurements, one symptom which gave us an idea that we did give an even dose, was about the time we had our skin reaction. We also had a reaction of the mucous membrane of the mouth and throat. This was very distressing to the patient and lasted about two weeks. We found that they could take milk through a straw for a week or so and got along very nicely. We also found that Dobell's solution as a wash or gargle was about as good as anything else. These patients usually become particularly nervous. Some of them suffered intensely from nervousness. This pain and nervousness we could control with bromids and luminal.

We treated a number of cases of carcinoma of the lung and we believe that our results have been far better than by the old method. If there was fluid, if the lung was involved, and I would say that all cases we have treated have been secondary to carcinoma of the breast, we have withdrawn this fluid. Where no contraindications existed we have performed artificial pneumothorax before giving the treatment. We adopted this procedure to enable us if possible to immobilize the parts slightly and get a certain amount of blood out of the field. That brings on the question of the damage to the blood.

As I said last year, our damage has averaged, in giving large doses in such cases as the breast or pelvis, about 500,000, or about a 10 per cent drop in the red cells. There has been a like drop in the white cell count. We are even more enthusiastic now regarding the advisability of building up the patient's blood before giving the treatment than we were a year ago. A year ago, when we first started, we were more or less nervous. We had observed the effects of a marked drop following treatment where patients dropped about two million red cells in one treatment. We had that early, but we have never had it since. We were afraid, so we adopted the rule that every patient who did not have 4,000,000 reds should be given a transfusion to build up his blood until he did have 4,000,000 red cells. And we find that these patients do much better. As a rule, every patient who has had a blood transfusion before treatment has responded much better to treatment. This is a very reasonable thing. We have had our patients in an institution and we keep them for ten days to two weeks for observation while giving the treatment.

We have had no cases of malignancy of the intestines except rectum. We have had several cases of malignancy of the stomach and of the liver and we have about come to the conclusion that our time was pretty well wasted. We do not believe that we can expect much from treatment where the malignancy involves the stomach and intestines. I do not mean to say that it is not worth trying.

To sum up the situation as we see it at present, there is no question that we are able to produce results by high voltage x-ray that we have never been able to produce by other treatment.

Of the three hundred cases treated I do not think that three cases have failed to improve. Fifty per cent have improved very markedly and the original malignancy has apparently disappeared in most cases. Of all cases treated I do not feel that any case has been injured by the treatment. The most serious ill effects were a few uncomfortable skin reactions. Some cases which looked hopeless have responded most markedly. Some cases with not such marked involvement have behaved very badly. The degree of involvement does not seem to give us much index as to the results we may hope to obtain, nor does the type of lesion give us much idea of what to expect from the treatment. Sometimes a type of lesion, supposedly very sensitive to radiation, will not respond at all, and in other cases a lesion with a histological picture indicating a type supposedly with very great resistance to radiation will respond very well. Probably the general condition of the patient has much to do with the results obtained.

High voltage x-ray therapy, as I see it, is a distinct step forward in the treatment of malignancy, as well as in the treatment of a number of non-malignant conditions. It is certainly founded on a scientific basis and is here to stay. Much improvement will be made within this year. Also much damage will probably be done by the inexperienced and over enthusiastic. This is to be expected in any new line of treatment and is not necessarily the fault of high voltage. High voltage x-ray therapy offers a palliation never before obtained, and possibly a cure in many cases, for it is not a question of how extensive a malignancy may be when we treat it with radiation so much as it is a question of how sensitive it may be to radiation. In other words, a surgeon necessarily considers how extensive a malignancy is. The great question which concerns the radiologist is how sensitive it may be to radiation.

Discussion follows paper of Dr. Lawrence, page 442.

HIGH VOLTAGE X-RAY THERAPY: SIX MONTHS' EXPERIENCE*†

By Sherwood Moore, M.D.,
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It was with great reluctance I consented to present the experience of six months' use of the so-called high voltage x-ray therapy to the Section on Radiology. This was due to the experimental character of the work, the shortness of the period of use and the impossibility of placing a true estimate on the value of this new agent in this length of time. There have been, furthermore, manifest shortcomings in the purely clinical aspects of the management of a rather large number of cases which have been treated by this method, the most serious of which has been an inadequate system of continuous interval observation of the patients. Of necessity the work done lacks finish, both because of its newness and the very large amount that has been done in a relatively short time. Still another reason for my unwillingness to present this subject lies in the fact that so many general statements in regard to the worth of the procedure will have to be made in lieu of the presentation of precise facts. It is earnestly hoped that this communication will be leniently judged. It in no sense represents finality in the effort to use correctly high voltage x-ray therapy.

Regarding the matter from another aspect, it occurred to the writer that perhaps the experience related herein might be helpful to others entering their novitiate and might spare them some of the anxiety he underwent. Because of the lack of concrete facts pertaining to this subject, it is incumbent upon every one engaged in it to bring out as many as he can in order that x-ray therapy in the treatment of malignant disease may have a wider use and that the very large class of patients for whom at present little or nothing can be done may receive such benefit as it promises.

Disregarding the theories of causation of malignant disease, with which we here have no concern, it may be stated that the individual in whom a malignant tumor develops has a fundamental deficiency and at the present time there is no reason to believe that radiotherapy can remove this. Such effect as it has is on the result of this constitutional deficiency rather than on its cause. Consequently radiotherapy, no matter how effective it may be in the relief of malignant disease, is but a symptomatic treatment, and therein lies its weakness and the explanation of its failures.

Physicists are agreed that it is the quantity of rays that are absorbed that produce the effect desired in tissue under treatment, and that such effect is related to the quality of the ray only in so far as the latter results in augmenting the former. Ultimately it is the corpuscular rays absorbed that produce the physiological action. Therefore, there is no inherent value in any particular source of radiation, be it radium or x-ray, so long as it produces the effective local intensity.

Biologically considered, the mode of operation of radio-therapy upon living cells is not so clear. It seems a simpler explanation and one more in accord with the theory of probabilities as adduced by observed facts to consider the action of the rays as purely destructive. The view that the rays set up a defensive mechanism in the organism has the drawback of excessive ingenuity. Where conclusions have been drawn from studies of irradiated tissues leading to the theory of stimulation of defensive reaction, it seems to the writer that the facts would indicate that damaged tissue and not radiation produced the picture. Nor can he agree with Ewing that the radio-therapeutic effect observed in tumors is to be explained by the action of the rays on the vessels of tumors.

Six months ago, when high voltage x-ray treatment was inaugurated in our institution, we were under the necessity of devising a system of applying this agent and a method of dosage without the benefit of advice from those having larger experience with it. You are all aware of the confused state of affairs

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which then obtained in regard to the value of the methods, of the contradictory reports, etc. In the face of this contingency we concluded that, stripped of its obscurities, indefinite statements and unwarranted claims, the 200 K.V. apparatus and tube were nothing more nor less than the logical development of the older apparatus; a more efficient instrument giving greater radiation values both in hardness of ray and increased quantity of the longer wave lengths, and by so much a far more dangerous instrument.

Starting with this view and holding to the theory of direct cellular action by the rays, a procedure and method were devised looking to the highest efficiency in delivering the hard ray where desired, with the maximum of safety to patient and operator. Treatment rooms were designed which fulfilled the requirements of protection both to operator and patient from undesired radiation, and completely from electrical shock. This arrangement will be shown later. Believing surface radiation of either direct or scattered form to be undesirable if not injurious, the arrangement hit upon suppresses all radiation save that in the field under treatment. Further to extend this idea, a rather small portal of entry, 15 cm. in diameter, has been used with a modified cross fire method of application. The portal of entry determined at the skin has been delimited by lead of sufficient thickness to exclude all rays save those directed to the field.

The aim has been to deliver throughout the tumor itself and its tributary lymphatic drainage, as high a percentage of radiation as possible without excessive damage to overlying structure. Skin reaction is therefore the basis of measurement. With this as a criterion, our technic was as follows: as many areas 15 cm. in diameter (avoiding overlapping) as would cover the involved region were selected and to each area the greatest intensity the skin would tolerate was administered, the factors being: focal distance, 50 cm.; average time, 2 hours to each portal; filtration, 1 mm. copper, 1 mm. aluminum; current, 4 M.A.; and voltage, 200 K.V. (Peak) as measured by a standard sphere gap. Generally but one hour daily was administered until the total dosage decided on had been given. This method of dividing the exposure over several days is the result of the early efforts to avoid too great strain on the patient. Though it might not seem so, as far as our experience goes, this is just as efficient a mode of administering treatment as the single massive dose method, and far less trying.

Two hours' time to the skin will not do for universal application. It answers for the abdominal skin of the adult, but the dose must be modified for more sensitive regions and for young skins. To illustrate, the method of treating uterine, rectal, bladder and prostate cases may be cited. For very large subjects with an extensive growth, two portals of entry are chosen, one to either side of the midline, just above the symphysis; two posteriorly exactly opposite the first; and one directly through the perineum. Small subjects are given but one area, front and back and the perineal area. Elsewhere in the body some modification of this plan is used.

There are certain clinical procedures that should be carried out on patients who are to receive this treatment and throughout its course, in regard to which we have not been so thorough as is desirable. These are careful observation of the blood picture, basal metabolic studies and, most important of all, the study of kidney function. At present we are engaged in carrying out the above procedures with the greatest care on a number of patients. The object of this investigation is an endeavor not so much to guide us in the practical administration of x-ray treatment, but to discover a means of estimating what can be accomplished by using methods less crude than the usual physical examination and statements of subjective improvement. Our efforts in this direction are yet too incomplete for publication, but so far there has been encountered no striking change in blood picture except an uncertain tendency to a leucopenia. Changes in red blood cells and hemoglobin seem to be governed by the ability to rest and take nourishment because of relief of pain, or the converse, rather than by the action of the rays. Where it has been tested, it was found that there is an increased basal metabolic rate

in those with tumors and there is a decline in this rate under x-ray therapy. Two cases have been elaborately studied chemically in an effort to determine the presence of, and to isolate such substances as might be produced by the breaking up of tissue, resulting from absorption of x-rays. These studies are inconclusive and are to be extended to a larger series of patients.

One fatality which we had from x-ray treatment and which we considered a case of roentgen sickness, initiated her decline by symptoms of kidney incompetence, including a very high increase in the non-protein nitrogen of the blood. Another, a case of myoma uteri, with but one kidney and that the seat of a tuberculous process, developed such an intense nausea that treatment could not be continued. The autopsy findings in another case, uterine, revealed an acute nephritis and in addition areas of focal necrosis in the liver, similar to those found in pernicious vomiting of pregnancy. These cases indicate to the writer that care needs to be exercised in the study of kidney function before and during the course of x-ray application. It further seems to indicate that x-ray treatment causes to appear in the organism a body or bodies analogous to those found in pernicious vomiting and that these produce the nausea, vomiting, etc., met with in intensive x-ray therapy. Studies of the urine and blood show that these unfortunate complications are not in the nature of an acidosis.

The material on which this paper is based consists of 214 cases, of which number 19 can be considered as experimental, i. e., the treatment was tried as a purely empirical measure. Of medical interest were 7 leukemias; 5 myelogenous, and 2 lymphatic. This method of treatment showed no excessive superiority over the older one for the same conditions. One case of polycythemia was unaffected by treatment and the one case of Hodgkins' disease, far advanced, died before completion of treatment and is included among our fatalities.

Of the total cases, 6 died while under treatment, 3 as a direct result of it, and in the remainder the treatment was a strong contributary factor to this outcome. Many others must undoubtedly have succumbed to the disease for which they were being treated since discharge, but it was impossible to determine their number. Of the complications occurring during treatment, anorexia, nausea and vomiting have been the most common and most troublesome. We seem to have had fewer of these than many other workers, to judge from reports. This we attribute to the broken dose method of treatment, perfect ventilation of treatment rooms and complete protection of patients from undesirable radiation. As others have stated, it was especially where radiating about the liver and stomach that these symptoms were most violent. When they supervene in intense form but one thing can be done, and that is to stop treatment. We have not yet encountered the complications reported by others, found in the skin, pleura, lungs and adrenals. There have been fairly severe skin reactions and cases of distressing cystitis and proctitis, all of which have in due course subsided. In treatments about the neck we have had dryness of the throat, loss of the sense of taste and smell and swellings of the parotids, but these have been of but short duration.

Treatment of cases of malignancy has been undertaken regardless of the extent of the disease, degree of cachexia, or existence of metastases. We are committed to the principle that treatment should be administered to such patients no matter how advanced the case may be, the dosage being mitigated according to the strength of the patient. Of 170 patients with malignant disease, all except two (amputations which were refused) were inoperable. In 8 cases, treatment was used as an immediate post-operative prophylactic measure.

There were 145 cases of carcinoma treated. Of these seventeen were carcinomas of the breast, two being primary inoperable and four immediately post-operative. Of the former, we have been able to follow one. She has had a wonderful recession. The others have not been heard from. Of the post-operative recurrences, we feel that the time has been too short to allow the newer method of treatment to show any great superiority over

the older. This statement holds true for the uterine carcinomas also. For two years the practice of our institution has been to employ both radium and x-ray in such cases and this is being done now. Since the result of such treatment can be attributed to the action of the radium, necessarily the relative merits of the old and new methods of x-ray treatment must be judged over a greater length of time than six months.

THE CARCINOMATA

Uterine.—Two of the uterine cases will be spoken of:

One, J. G., having had two applications of radium, which failed to produce any effect on an enormous growth of tumor reaching to the umbilicus, had complete recession of the malignancy, as was attested by bi-manual examination. However, when high voltage x-ray therapy was instituted, she had extensions into the pelvic girdle and they were unaffected and have remained so. This patient is now in extremely poor condition.

Another, A. W., with the greatest development of cancer compatible with life, in which the vagina, bladder and rectum were one huge ulcerated cavity with only fragmentary remains of the uterus, died. Allusion to her autopsy has been made in the first part of this paper. Careful search of the tissues after autopsy of this cavity revealed an almost complete absence of any cancer cells and show a picture of extreme degree of hyalinization of the areas in which infiltration had existed.

Genito-Urinary.—Of the genito-urinary tract, excluding uterine and vaginal cases, there were 14 cancers of the prostate, one kidney tumor, three cancers of the bladder and five papillomas of the bladder. The majority of these patients had great subjective and some local improvement. Two of the cases of papilloma received astonishing benefit; one, after being confined to the house because of urinary frequency, has at present a normal capacity, and from having the bladder wall completely involved, the area of existing involvement is now about 2 cm. in diameter. Sufficient time has not elapsed to speak definitely about the prostatic cancers, but even these as well as the urinary cases above mentioned had relief of symptoms.

Gastro-Intestinal.—In the gastro-intestinal tract there were 14 cases of cancer of the esophagus in which we used x-ray as a supplement to radium administered by my colleague, Dr. R. W. Mills. We do not consider that we have bettered his good results. Five cases of cancer of the stomach have been treated with results that must remain *sub judice*. We do not, however, consider that we have impaired their condition by using the x-ray. Two cases of carcinoma of the cecum, one confirmed, the other a clinical diagnosis, were without evidence of beneficial effect.

Mouth and Jaw.—About the mouth and jaws malignant cases have been treated by a combination of radium, x-ray and surgery. It is difficult to say that the newer method of x-ray treatment has, as in cancer of the breast, shown any great superiority. But 5 of these cases will be superficially mentioned:

One, B. C., a case of recurrent cancer of the antrum with a fungating mass filling the nose and pharynx, had complete recession at the end of six weeks and has seemingly remained well. Another, O. E., had metastases to cervical lymph nodes after excision of the tongue, and died probably of metastases to the mediastinum. An incomplete post mortem examination revealed that he had a complete disappearance of cancerous tissue in the neck which had been extensively infiltrated. One, S. A., with cancer of the antrum, received no benefit from treatment. Another case, M. T., with recurrence after radium application to cancer of the lip, steadily progressed in spite of treatment. The same was true of S. E., with a cancer involving the mandible and structures of the neck, probably since dead.

SARCOMATA

Of the tumors, 25 belong to the sarcoma group, all but four being histologically confirmed. These four were clinically undoubted cases of sarcoma. All but nine cases had known metastases and of these two were early sarcoma of the testicle, immediately post-operative, to whom treatment was administered as a prophylactic measure. Four patients were cases of post-operative recurrences of gliomata. They derived as little benefit from treatment as their condition premised. Two cases had lymphosarcoma, one of the groins, with infiltration down the thigh, and the other extensive involvement of the mesenteric nodes. The latter is at the present time in outwardly good health, after a great gain in strength and twenty pounds in weight. The other case has been put back on his feet and has been advised to return to work. Three cases were melanomata, all with metastases, one

a recurrence to the abdominal viscera nine years after evisceration of the orbit; one general, primary on the sole of the foot of three years' duration; and one in the glands of the groin and pelvis after removal of a mole on the leg a few months previously. Of these three the most recent one gave the only manifestations of benefit. From being almost completely disabled two months before she now plays golf, has no pain, and no tumor can be discovered in the groin. The case with the growth on the sole of the foot had great local recession, but the tumors elsewhere were unaffected.

There were two cases of round cell sarcoma, one of the liver and the other of the head of the tibia. The latter, one of the earlier cases, is still in excellent local and general condition nine months after primary diagnosis. The patient with the sarcoma of the liver showed great diminution in size of the organ for two months, but at the present time it is enlarging rapidly. There was one case of sarcoma of the thyroid in a woman 70 years of age whose condition was critical from tracheal pressure. Her dyspnea was promptly relieved through treatment and there was marked lessening of the size of the gland, but since she has not been heard from for a long time and at last report was again having respiratory distress, she is probably dead. There was one case of abdominal sarcoma recurrent from a primary growth in the round ligament. This case has a long history and hence is of a low degree of malignancy. There was no reason to believe that she was helped by treatment.

Three cases were primary testicular growths with abdominal and other metastases. One showed marked recession of symptoms, pain and mechanical partial bowel obstruction. He died suddenly on the eve of discharge from the hospital and at autopsy was found to have a staphylococcus septicemia, the source of infection seemingly in the site of two large abscesses on the forehead and buttocks. The other two cases occurred in brothers and will be dealt with when the slides are shown.

There were two cases of sarcoma of the orbit. It is too early to judge in regard to the one and the other is having doubtful benefit. There was one case of the leuco-sarcomatosis of Sternberg with leukemia recently dead, who did well under treatment but became slowly more anemic and x-ray treatment had to be discontinued. Of the four unconfirmed cases, probably all are dead. They were far advanced and, being dispensary patients, were difficult to keep under observation.

In summing up it seems to the writer that he has not made a good case for high voltage x-ray therapy, but this was not his intention. The endeavor has been to relate the experience without bias. On one point the writer believes there can be no discussion, one that, unfortunately, cannot be incorporated in a paper of this kind, viz., the great relief and subjective improvement which the patients undergo by this method of treatment. This agent seems to the writer to be one of the most effective palliatives that he has known, and on that score alone its use in the treatment of malignant disease is to be encouraged and extended.

CONCLUSIONS

(1) There is no inherent superiority in so-called high voltage x-ray therapy over the older methods and over the employment of radium save that it is far more efficient.

(2) Experience in treating 214 cases over a period of six months would indicate that the earlier of these cases derived sufficient benefit to make this the therapeutic agent of choice.

(3) Even in advanced cases the relief of pain and the sometimes astonishing subjective improvement brought about by this method of treatment would indicate its application regardless of the hopelessness of effecting a cure.

Discussion follows paper of Dr. Lawrence, page 442.

OUR EXPERIENCE IN THE USE OF DEEP THERAPY, 200 KILOVOLTS OR MORE*

By D. Y. Keith, M.D.,
and
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The basis of this paper is formed from a series of one hundred and thirty cases treated over a period of six months using two hundred thousand kilovolts or more. The anatomical locations of the lesions are as follows:

Carcinoma of the cervix	23
Carcinoma of the uterus	8
Carcinoma of the vagina	1
Carcinoma of the breast	27
Carcinoma of the gastro-intestinal tract	9
Carcinoma of the genito-urinary tract	9
Papilloma of the ovary metastasizing	3
Carcinoma of the testicle metastasizing	1
Carcinoma of the lip and tongue, etc.	17
Thyroid	3
Sarcoma	9
Hemangiosarcoma	2
Myxosarcoma	1
Hodgkins	3
Destructive arthritis	1
Undiagnosed tumor of the chest	1
Uterine fibroid	9
Splenomyelogenous leukemia	2

CARCINOMA OF THE CERVIX

Early or pre-cancerous	7
Moderately advanced without extension	4
Advanced with extension	6
Post-operative recurrent	2
Post-operative metastasizing	1
Post-radium	1
Post-cautery	1
Metastasizing	1
Total	23

In carcinoma of the cervix seven have been early cases which could be classed as pre-cancerous or that type of case that is impossible to diagnose without a microscopical study. They have been treated as malignancies. One of these seven occurred six months following a hysterectomy for uterine fibroid and should properly be classed as carcinoma of the cervical stump. Four cases were moderately advanced without extension into the adjacent organs. Six were late advanced cases with extension into adjacent organs. Three were post-operative after surgical removal or attempt at surgical removal. One was a post radium case fifteen months after application of radium. One was after cauterization of the cervix. One was metastasizing to the scalp and lumbar lymph nodes and was treated for pain in the spine and hips.

We feel in looking over the above classified list that we should feel very hopeful of our teaching. As you will notice, only three of twenty-three have been subjected to surgery. In other words, it is becoming recognized that carcinoma of the cervix is no longer a surgical condition and we are receiving and will receive many earlier cases than we have in the past. If we are teachers in our community, it should be encouraging to know that the teaching is showing results.

You will also note that seven cases were early cases classed as pre-cancerous. It should be exceedingly pleasing to us as radiologists to secure more than thirty per cent (30.43%) of early cases. A great deal of this has been due to the good results obtained in radium and the education received from deep therapy.

CARCINOMA OF THE BODY OF THE UTERUS

Early cases	1
Late cases inoperable	5
Post-operative advanced	1
Body and cervix (?)	1
Total	8

In the eight cases of carcinoma of the body of the uterus one was an early case in which the heart complicated any surgery. Five were late cases and considered inoperable. One was an advanced case when seen in which the tubes and ovary had been taken out with a diagnosis of hematosalpinx. One was an early case with so much erosion of the cervix that the diagnosis was a probable carcinoma of the cervix also. A carcinoma of the body of the uterus is primarily surgical.

CARCINOMA OF THE BREAST

Early cases, no palpable nodes	3
Pre-operative	3
Post-operative immediately after operation	6
Metastasizing axilla supra and infra-clavicular	10
Post-operative recurrent	3
Post radiation (200 K. V.) metastasizing	1
Hopeless, lung, axillary metastasis	1
Total	27

*Read in Section on Radiology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

In the twenty-seven cases there were three that had had no surgery and were free from metastasis. In two of these the tumors have completely disappeared and in the other it has not been long enough time since treatment for complete disappearance. They are all being watched closely and examined by the surgeon each time they are seen by us. Three of the cases have been rayed before operation and are to be rayed after operation. Six have been seen for post-operative raying immediately after the operation. Ten of the cases have shown metastasis either in the axilla, supra or infra-clavicular, or all three, and were considered inoperable either from the extent of the malignancy or from the physical condition of the patient. One of these has improved so much in weight and strength that the breast which was ulcerating has been removed.

There have been three recurrent post-operative cases. One was a late result from early radiation of two hundred thousand volts or more. This patient received in an Eastern hospital about one year ago approximately twelve hours of radiation directed toward a supra-clavicular metastasis. Five months later six hours were given. When seen by us a short time before her death there were no palpable glands above the clavicle or in the axilla, though there was a marked skin metastasis around the area of radiation with marked fibrosis of the skin and lung. This type of case is too malignant to expect permament relief. One was a large ulcerating breast with axilla and supra-clavicular and lung involvement. This type of case is hopeless and should not be treated.

CARCINOMA OF THE GASTRO-INTESTINAL TRACT

Esophagus	2
Stomach	1
Cecum	3
Descending colon	1
Rectum	2
Total	9

Two have been esophageal, one showing two stricture points and the other having a complete occlusion, which was treated after a gastrostomy. Both have shown decided improvement. The gastrostomy case was able to swallow in the normal route six or seven weeks after the beginning of treatment. The other patient was able to eat solid food within ten days after beginning radiation and has continued to improve. Our experience with lower voltage has been that the esophageal symptoms and distress in swallowing disappear, the patients dying with metastasis usually in the liver.

One carcinoma of the stomach has been treated against our judgment without any improvement, dying a few weeks later. No gastric malignancy with cachexia has been treated since. A sense of judgment equal to that of a real surgeon is to be attained in selecting the case to treat.

There have been three carcinomas of the cecum, one after the operation of short circuiting. This patient has not improved very much, though alive seven months after treatment. The other two carcinomas of the cecum have been so diagnosed clinically and by bariumized enema. Both have shown marked improvement with gain in weight, improvement of gastric distress, indigestion, etc. Both are free from any palpable tumor or any filling defect fluoroscopically and by film examination.

The one treated with carcinoma of the descending colon had a perforation with abscess before treatment and was rayed before operation with one hundred twenty thousand volts. Radium was also used and two hundred thousand kilovolts used post-operatively. There was a decided reduction in the size of the tumor with a lessening of pain, though no great improvement in the patient. He died recently, eight months after operation.

In the three carcinomas of the rectum radium has also been used. Two have improved rapidly. One did poorly, has had a colostomy and was found to have a metastasis in the liver. In our rectal cases that do poorly we should look for and expect liver metastasis.

CARCINOMA OF THE GENITO-URINARY TRACT

This embraces nine patients with lesions located as follows:

One carcinoma of the penis.

One hypernephroma.

Four carcinomas of the prostate without surgery with definite extension.

One carcinoma of the bladder.

One simple hypertrophy of the prostate:

In the carcinoma of the penis the lymph node areas were treated, the original lesion being treated with radium. All the genito-urinary cases have shown improvement and in two of the carcinomas of the prostate without surgery the prostate at present is not palpable. The patients have returned to their work.

FIBROIDS OF THE UTERUS

In fibroids we have used deep therapy in four cases of large uterine fibroids in addition to the use of radium. One large fibroid has been treated by x-ray alone, as we were unable to enter the uterus even by a small probe. Four small fibroids were given x-ray in addition to radium, as they were probably malignant.

RARE CASES

Of the rarer cases we have treated one case of destructive arthritis of the hip for relief of pain, the patient receiving unquestionable relief for a period of a few weeks after each treatment. She was confined to bed on account of pain, and since treated she is able to be about her household duties.

There have been two splenomyelogenous leukemias treated in which we see no more improvement than with the lower voltage.

Two toxic thyroids have been so recently treated that no improvement has been noticed. One large adenoma of the thyroid with calcareous deposit has shown marked improvement.

TESTICLE

There has been one case of metastasis in the lumbar region, chest and axilla from an infantile carcinoma of the testicle or what some of the older pathologists call "round cell sarcoma." This patient showed great improvement with relief of pain in the lumbar area and complete disappearance of the tumor in the upper lung field, dying a few days ago with a metastasis in the liver and lymph nodes in the region of the diaphragm. This area was purposely omitted from radiation on account of the adrenals and liver.

HODGKINS

There have been three cases of Hodgkins, two of which were recurrences from former radiation. The one case treated has shown improvement with complete disappearance of the tumors within a period of four or five weeks. To us this is much more rapid than we have experienced with the lower voltage.

SARCOMA

Under sarcomas we have classed two lymphosarcomas, one springing from the tonsil with general metastasis in the groin, each axilla and the orbit. All of these metastasizing lymph nodes regressed very rapidly. One patient resumed his work and is symptomless six months after the termination of treatment.

The other one started within the chest, probably in the mediastinum, a microscopical diagnosis being made from a lymph node above the clavicle at the Mayo Clinic. The patient was treated at the Mayo Clinic with the old voltage and showed improvement with a great deal of nausea. This patient was a physician and insists without question that his improvement has been much more rapid under the higher voltage and that there has been less nausea. His entire left chest was blocked with only one quart of fluid present. A chest film a few days ago shows great reduction of the tumor mass and at present he is able to be at his office two or three hours each day.

BREAST

We have selected three breast cases in which no radium has been applied that are fairly typical. Most breast cases will fit one of the three types.

Case I.—Mrs. K., age 45 years, was seen on May 4, 1922.

Her family and personal history were negative.

Present History.—The patient stated that six months before she was injured in an automobile accident and received a bruise on the left breast. Soon afterward she noticed a tumor in the outer upper quadrant, which had gradually grown. It was quite tender to pressure, heat or cold, and for the preceding few weeks had been giving pain.

She was a well developed, well nourished individual, weight 140 pounds. The breasts were quite large and pendulous. The left breast presented a nodule in the upper outer quadrant ap-

proximately four centimeters in circumference, quite tender on pressure with a chain of "shotty" nodules in the pectoral muscle. The axillary, supra and infra-clavicular lymph nodes were not palpable.

The patient was examined and referred to us by a surgeon with a clinical diagnosis of cystic adenoma of the breast.

She received three series of treatments, the first with lower voltage and the others with the higher voltage, receiving in all a total radiation directed toward this breast of seven hours and twenty minutes. She has reported for monthly examination.

The first examination, made four weeks after the first application of deep radiation, showed that the small "shotty" nodules had entirely disappeared with great reduction in the size of the original nodule, which was not more than 25 per cent of the original size.

Examination six weeks later, which was four weeks after the second application of two hundred thousand kilovolts, showed no palpable tumor in the pectoral muscle or the left breast. There was only slight tanning of the skin. The patient was free from pain and tenderness.

She was last seen September 25, four months after the first application, free from any evidence of disease.

We believe an examination every six to eight weeks will be obtained in this patient. At least, this is what we insist upon for one year.

Case II.—Mrs. O., age 49 years, was seen July 19, 1922.

Her family and personal history were negative.

Present History.—She had had a tumor of the right breast for seven and a half years, which caused complete destruction of the greater portion of the gland. Several months before she noticed a few nodules above and below the clavicle and about three months before began to have edema in the arm, which was followed by edema of the forearm and of the fingers. She did not consult her physician until a few days before I saw her, at which time the affected arm was more than twice the size of the other arm with such edema of the forearm and fingers that it was impossible for her to close her hand completely. There had been very little pain.

She was a very small brunette, thin, poorly nourished, weighing 84 pounds, with ulceration of the entire right breast involving the nipple. The upper and inner quadrants were completely destroyed. There were two or three palpable glands in the axilla the size of an olive. Both the supra and infra-clavicular lymph nodes showed multiple involvement, were woody hard in character and gave the feel that the entire cervical area on this side was woody hard or board-like, an involvement of all the lymph nodes.

An x-ray film of the chest showed no markings that would suggest pulmonary metastasis. The upper lobes had the markings of a fibroid phthisis, the greater calcification being in the upper left lobe.

She was given two series of treatments. The first was July 19 to 26, at which time she received five hours' application, two hours to the anterior breast, two to the posterior breast and one laterally to the axilla. Improvement in the edema of the hand was noted by the patient on the fourth day and before she left the hospital, on the ninth day, the reduction of the arm, forearm and hand was perceptible to every one on the ward.

She was seen one month after the last treatment was given. At this time the lymph nodes in the axilla and supra and infra-clavicular areas had completely disappeared. There were no isolated nodules that could be felt. The woody character of the tissues above the clavicle had very nearly disappeared. The ulcerated breast was covered with a dense heavy scab very dry in character. This, when removed, left only a few nodules the size of a match head, which bled on friction. The edema in the hand and forearm had entirely disappeared, leaving only slight infiltration in the arm.

At this time she was given another application over the left chest anteriorly and posteriorly. When seen on October 9 the ulcerated area had completely healed except two small nodules the size of a match head. These two small areas were treated with radium and no x-ray was applied.

She has gained six pounds in weight and is now within two pounds of her maximum weight. She has a beautiful bronze tan on the entire left chest and shoulder, without desquamation except on the scapular area, which is probably due to perspiration on this area during the warm days in bed.

Case III.—Mrs. R. was first seen on April 21, 1922.

Her family and personal history were negative.

Present History.—Three years previously she noticed a small tumor in the right breast, which grew very slowly until the preceding five or six months, since which time it grew very rapidly with ulceration, craterization, sloughing, and a great deal of foul odor.

Examination showed a well-developed, poorly-nourished, anemic individual who had lost thirty pounds in weight. The breasts were very large, showing an ulcerated area of the right breast approximately seven inches in length and four inches in breadth. There were no palpable glands in the axilla or supra and infra-clavicular lymph node areas. She was considered inoperable on account of her exhaustion and anemia.

She received two series of x-ray, which totaled eight hours' application, five hours being given anteriorly, two hours posteriorly, and one hour laterally to the axilla. She had a great deal of nausea without vomiting which persisted for three weeks after the first application. She then began to improve with increase in appetite, and within two weeks' time had gained twelve pounds. The discharge decreased rapidly with a reduction of the foulness of the odor and a great deal of reduction in the size of the breast.

She was also given radium application, the needles being inserted directly into the margin of the ulcerated area and allowed to remain for twelve hours. Following this she had a great reduction in the size of the breast with great fibrosis. The breast is not more than 20 per cent of the size of the corresponding breast.

It was thought best to remove the breast on account of the great fibrosis and the presence of the ulceration. One angle of the ulceration presented a typical radiation ulcer. She was operated upon on October 21 and there has been no marked delay in the healing of the wound. She regained her original weight, feels well, happy and enjoys life. She has received extension of her time without any great risk of life or pain. Below is a copy of the microscopical report:

"Gross Description.—Specimen consists of amputated breast with underlying fascia and fat, 120 x 80 x 46 mm., firm. No nipple present. In the center is a fissure, 43 x 14 x 16 mm., the lining of which is yellowish gray and slightly rough. The cut surface is yellowish gray with scattered fibrous striations.

"Microscopical Diagnosis.—Ulcer, with no positive evidence of malignancy.

"Final Diagnosis (October 26, 1922).—Three additional sections show extensive necrosis with acute and chronic inflammation. Two ducts show epithelial hyperplasia, but no positive evidence of malignancy."—STUART GRAVES, *Pathologist.*"

Case IV.—Dr. M., a physician, age 61 years, stated that he began losing weight about two years before we saw him, and in the fall of 1921 had an x-ray diagnosis of a probable malignancy of the cecum. For the greater portion of that year he had indigestion and was unable to eat any foods with comfort. He had a great deal of gas, abdominal distress and constipation.

He was a well-developed, poorly-nourished, anemic, blonde individual who looked to be completely exhausted. Physically there was a mass in the right lower quadrant in the region of the head of the cecum. The palpable mass was five or six inches in length and three inches in width, apparently oval in shape, hard, indurated, freely movable, and quite tender on pressure.

X-Ray Examination.—A bariumized enema showed a filling defect in the head of the cecum. This was followed a few days later with a barium meal which also showed delay (iliac stasis) with a filling defect of the cecum as from the enema.

The patient was considered inoperable on account of his great exhaustion, anemia and digestive disturbance.

We started treatment on August 18, the first series being given between August 18 and 30. He received in all a total of six hours and fifteen minutes. We used two hundred thousand volts, twenty-one inches anode skin distance, one millimeter of copper, one millimeter of aluminum and one thickness of sole leather as filters. The diaphragm opening was eight inches square, using anterior and posterior portals of entry. It was hoped by his physician and surgeon that he would improve enough to be able to stand an operation.

He reported again on October 10, six weeks after the first series, and had so improved that both he and his physician were questioning whether it was advisable to do any surgery. At this time he received another series of treatments. We used the above technic and gave four hours' time, using two portals of entry, anterior and posterior. He received in all ten hours and fifteen minutes' radiation.

His gain in strength, improvement in appetite and digestion began about two weeks after his first series was completed. Between the first and second series he gained fourteen pounds in weight and when last seen, October 26, he had gained twenty pounds in weight, was feeling well and was thinking of resuming his work. The tumor at this time was barely palpable and there was no filling defect of the cecum from a bariumized enema either fluoroscopically or upon the film. Slight tenderness was still present over the site of the tumor. The tumor was not palpable.

What would be best for this patient? Should he have his cecum removed or should we wait? We expect to keep a close watch upon him. Our judgment is that the portion of the intestine that bore the original tumor should be removed. We believe that at present it would show only fibrosis and chronic inflammation microscopically, as the above breast case has shown.

TECHNIC

One of the practical points in technic is the arrangement of the machine within a room in which the air is changed every fifty-eight seconds by an exhaust fan. The patient receives his treatment through a hole in the wall or through a hole in a barrel and at no time receives any odor of the gases coming from the tube or machine.

We use on the pelvic cases a standard anode skin distance of fifty centimeters pulling two hundred thousand volts, sphere gap measurement, four milliamperes of current, using one millimeter of copper and one millimeter of aluminum with either clothing, blankets or a piece of sole leather next to the patient as a filter.

For our neck cases the same factors have been used with a skin distance of sixty centimeters, always using a piece of sole leather over the face and neck when blocking the cervical glands.

The diaphragm opening is eight inches square with adjustable diaphragm openings so we are able to make openings two, four, six or eight inches square for fields. The room that houses the tubes and machine is lined with three-sixteenth inch lead and is frequently tested at night with a fluoroscopic screen to detect any leaky cracks. Dental films faced toward the tubes and covered with lead numbers have been pasted in various points of the operator's booth. These are allowed to remain for two weeks and are then developed to see if we are getting any ray. The operator also wears a dental film. We believe we are fully protected.

Measurements with the ionization chamber are of value and should be used until the skin reactions to different filters, time, etc., are known. We believe all workers in a short while will adopt the old measurements of voltage by sphere gap, milliamperes through tubes, time of exposure, filters, anode skin distance and the size of the field when trying to describe their technic to other workers. It is our belief that the ionization chamber will play the same role in treatment that the Pastille and photographic paper did in former days and that in a short while we will all be speaking of our dosage in the above terms just as we do now when we use the lower voltage, giving our milliampere minutes, filters, size of the field, etc., as factors.

We have found that sixty-five minutes' time using the above mechanical factors will prove an epilation dose with barely perceptible tanning of the skin four weeks later. One hundred and five minutes give a decided tanning, while one hundred and ninety-five minutes will give a definite blister with desquamation of the skin requiring six to seven weeks to recover with very marked permanent tanning and dryness of the skin.

NAUSEA

We, as a rule, never give more than one hour's application to any patient at one dose. We have found that if we go very much over this time the patient suffers from nausea, vomiting and great depression. A treatment is repeated after a rest of forty-eight hours. In other words, the patient receives his treatment every other day. On the morning he is to receive treatment he has one cup of coffee, tea or milk and one slice of toast, and when he returns to his room no fluids are given for three or four hours. The first nourishment given is as hot as the patient can take. We know we are having much less nausea than we had with the older voltage, though we are giving from 50 to 100 per cent more time than formerly was given. We endeavor to have a normal defecation daily, which usually requires laxatives. The day previous to treatment as much fluids are given as we can force the patient to take.

We tried on several patients the use of chloretone both by enema and by mouth to lessen the nausea and believe we had more than we are having at present. We also tried bicarbonate and glucose solution by enema and a great many patients found that the enema upset them considerably. We had more nausea when soda enemas were given the day previous and on the morning of treatment than we are having in the past few months. Two to four ounces were given by enema every two hours until one pint was taken the day before treatment. Alkalization of the patient is desirable if not too objectionable to the patient. The ante-radiation and post-radiation treatment is as important as in any surgical case.

TUBES

Some of you may be interested in the life of tubes. We have used three tubes which have given a combined exposure of four hundred and seventy-seven hours. In one tube we were unable to get the Coolidge filament to light. We returned it for repairs and the Company very promptly returned it, saying that it had been under severe tests and they could find nothing the matter with it. Since this we have used this tube without trouble. We expect to have trouble later, as the tungsten wires to the filament must have broken.

One tube has become uncertain, though it works perfectly with the lower voltage. We are using it at present on one of our lower voltage machines for superficial and thyroid work. All of our tubes were run

for several weeks on the low voltage before a heavy voltage (200,000) was used, and we feel there is little doubt that this seasoning is very valuable and will increase the life of the tubes.

RESULTS

The immediate results in the pre-operative cases are the quick disappearance of the tumor, which is certainly more rapid than with the lower voltage. The immediate palliative results in the hopeless cases have shown more quickly. In the breast cases with metastasis in the axilla, supra and infra-clavicular glands, the metastasizing nodes have shown beginning disappearance within four or five days' time. They certainly disappear much more rapidly than formerly. Breast tumors without metastasis recede faster than metastatic nodules or post-operative recurrent nodules.

We feel that to obtain the best results we should have as accurate a diagnosis as possible, and that we should exercise judgment in the promises we give to patients and their friends. It would probably be best for the newer radiation: (1) if no patient in bad condition generally were treated; (2) if no tumors complicated with infection were treated; (3) if all of us had excellent equipment with which to produce a homogeneous radiation.

In combating malignancy we need surgery, roentgen ray, radium and sometimes a combination of all. We are recommending and endeavoring to get as many patients for pre-operative radiation as possible. The earlier cases with no palpable lymph nodes are given heavy doses and if the original tumor disappears no surgery is done. The patient is seen every month or six weeks with the surgeon in conference.

No one should start treatment of malignancy unless he expects to follow up the patient to watch for recurrences or metastases and apply radiation early if possible. The surgeon or radiotherapist who does not "follow up" his patients for recurrences or metastases is not giving them the service he should.

We have progressed in the control of recurrences, and as our technic improves better results will be attained.

In some of the inoperable cases that were metastasizing there is so much improvement in the reduction of the size of the tumor and the general condition of the patient that patients may be operated upon later to be followed with post-operative radiation. We prefer radiation before surgery though we find that many of the leading surgeons of the country today are recommending post-operative radiation. If these gross palpable or visible lesions can be made to disappear under proper radiation the cells that are microscopic from which they sprang should be very much more easily destroyed. There is no doubt in our experience of a few cases treated without or before surgery that a greater service is given the patient in pre-operative than in post-operative radiation.

If we can obtain the cooperation of our leading surgeons and get them to advise pre-operative radiation, the plan of treatment to be arranged by a conference with the patient, the practitioner, the surgeon and radiotherapist before any surgery is attempted, we shall obtain more permanent cures and many patients in whom extensive or radical surgery will not be attempted. Have we not all experienced enough radical surgery in malignancy?

Discussion follows paper of Dr. Lawrence, page 442.

THE DIAGNOSIS AND TREATMENT OF CERTAIN MEDIASTINAL TUMORS*

By W. S. Lawrence, B.S., M.D.,
Memphis, Tenn.

At the annual meeting of the American Roentgen Ray Society in New York, in 1908, I had the pleasure of reporting a case of a large mediastinal tumor, presumably sarcoma, treated successfully by the x-ray.

This patient was almost *in extremis* when treatment was begun, suffering all of those distressing symptoms to which mediastinal pressure gives rise. The tumor itself was about five

*Read in Section on Radiology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

inches in diameter. Improvement began within 24 hours after the first treatment. Very light, old style, unfiltered treatments every other day for a month brought about a complete symptomatic cure, although the tumor itself was still as large as a small orange. This patient lived three years in comparatively good health and finally died of lung abcess caused most likely by the breaking down of the remains of the tumor.

The fact that I have recently had a very similar case has prompted me to present a short paper on this subject. I cannot show you slides of the first case mentioned, but the second you may watch from its largest stage at the beginning of treatment, through the various stages of absorption, till it reaches almost or quite the vanishing point where it remains today.

Before going more into detail in this case a few remarks on mediastinal tumors in general may not be out of place, but I shall certainly not take up your time by a lengthy discussion of classification, etiology, symptomology, etc. All of this is set down in the books for him to read who may.

Briefly then, tumors of the mediastrium are either benign or malignant. Most of the benign tumors do not give symptoms and are discovered only at autopsy. Some of the benign cystic tumors become serious and even fatal from ever-increasing pressure.

Of the malignant tumors, carcinoma, that is, primary carcinoma of the mediastinum, is very rare, whereas primary carcinoma is by no means uncommon. Most of these tumors arise from the lymphoid tissue of the mediastium and may be classed as lymphosarcoma.

Given then a rather rapidly growing, symptom-producing tumor of the mediastium, we are most likely dealing with a sarcoma and not unlikely with a lymphosarcoma. This tumor should in all reason be quite suceptible to the influence of radiant energy, and such has proved to be true in the cases here mentioned.

In Osler's "Modern Medicine," the article on "Sarcoma of the Mediastinum" has nothing to offer in the way of treatment. These patients die within the year the author says, and cure is not to be expected.

Fortunately today we have something to offer for the relief and symptomatic cure of the most common of all forms of mediastinal tumors. One of my cases lived in comparative comfort for three years. How long the other will live, I do not know. But this I know: he now regards himself a well man, and the tumor itself has disappeared as completely as have the symptoms to which it gave rise.

The case referred to is that of a white male, age 29. Omitting all that part of the history and findings that have no bearing upon the final diagnosis, we have about as follows: Present Illness.—Swelling in the face came on gradually, beginning about four months previously. Choking sensation was especially bad at night. There was dyspnea. No pain. No fever. The left arm was much swollen. The right hand swelled at times. There was some dizziness and weakness.

Physical Examination.—Patient was well nourished. Face and eyelids much swollen, also neck and arms, particularly the left, but it was not edematous. Neck measures 19 inches. Normal is 15½. Marked dilatation of blood vessels over the lower end of the sternum and anterior portion of the chest extending along costal border. Respiration murmur was full and equal on the right and left.

X-ray of Chest.—It shows a large mass just above the heart and considerably larger than the heart as it is about six inches in extreme diameter.

Diagnosis.—Mediastinal tumor, likely sarcoma.

The slides tell the rest of the story more forcibly than words.

DISCUSSION—SYMPOSIUM ON DEEP X-RAY THERAPY

Papers of Dr. Millwee, Dr. Moore, Drs. Keith and Dr. Lawrence

Dr. Edwin C. Ernst, St. Louis, Mo.—We must not fail to consider carefully the filtration question, the very important physical changes brought about by filtrations and their direct relationship to the biological effects upon the tumor cells radiated.

We know that the lower voltage rays and the accompanying lighter filters give satisfactory penetrations in chest tumors when the tissues through which these rays pass are translucent, but when treating the denser structures, it is necessary to obtain a satisfactory dosage of x-rays, and this can be accomplished only by the shorter wave length radiations. However, the filtering material must be both physically, economically and biologically correct. We must understand the physical and biological limit of effectiveness; the quality and the quantity of rays

penetrating the filters and reaching the deeper structures.

When we eliminate the possibility of over-filtration of the rays employed, we are in a position to make biological observations.

The question of local and general actions and reactions of the cells must be considered in relation to the quantity and quality of radiations employed. In most instances we prefer not to give the patient a single dose of radiation at one sitting, for we have not found the single dose either satisfactory or practical in routine cases. There are wide variations as to the method of administration and the quantity of x-rays employed, although some authors are inclined to report and make use of a definite fixed lethal cancer dose in all cases. The method of non-variable or a fixed routine dose has not proven satisfactory in our hands.

I do not believe that any of the essayists referred to the question of over-radiations. In those cases in which we purposely produced a marked superficial tissue destruction, especially in surface breast lesions of the recurrent type, the results were not satisfactory. Therefore, it seems to us that the question of dose will always remain an individual consideration, in reference to the local lesion as well as the individual patient.

The question of intensity of the x-rays is very important. Throughout the country radiologists have reported a large variety of milliampere-minute x-ray dosages, under what would appear as uniform electrical conditions and voltages. Yet physicists who have checked these transformers and measured their output under similar voltages and with the same filtrations, have found from 30 to 60 per cent differences in intensity. No doubt, within the next few years, better methods of measurement will be adopted, and the radiations employed throughout the country will be more uniform. The iontoquantimeter, which we constantly employ, is the best check and the only one today which can be relied upon.

Last year there was some discussion of the comparative values of the softer and the harder x-rays, the longer and the shorter wave length radiations employed, and their individual effectiveness upon pathological tumor cells. We began a series of experiments upon superficial cancer, employing high voltage radiations, but again filtering these rays through five and ten centimeters of water, which is equivalent to five and ten centimeters of human body tissues. In most instances, we found these hard rays to be as effective in cancer cells as the softer rays. It was merely a question of quantity. The experiments were equivalent to radiating an epithelioma upon the back of a thin patient, after allowing the rays to penetrate to this area from the anterior surface of the patient.

Dr. C. A. Waters, Baltimore, Md.—I would like to ask Dr. Millwee what blood count he considers a safe limit for a full lethal cancer dose. Already we have given some cases too much treatment. The blood count, particularly of the white blood cells, is the best indicator of what the patient can stand.

No doubt many of you are here to determine whether you will purchase one of these new machines and go into the field of deep x-ray therapy.

I have found that the cost of the machine is a small item, in comparison with the fixing up of rooms suitable for the work. The lead lining of our walls, floor, ceiling, etc., cost more than a thousand dollars. Our next great difficulty came from the terrific noise of the rectifying device. The entire neighborhood rose up in arms against this noise, which I must say was very objectionable. After making a room dead sound proof we found that the ventilation was insufficient and the transformer got hot. Any opening on to the street caused the cracking sound (rectifying noise) vibrating against the brick walls and pavements to increase.

After six months we have been able to work out a series of shutters and fans which allows little noise. Breakdowns caused by static discharges are bound to occur at first, irrespective of salesmen guarantees that these will all be taken care of. They are new conditions and are not to be foreseen by anyone until they actually happen. Each installation is different.

To get cases one must be able to show with some degree of certainty that he can get results comparable with his colleagues. Dr. Kelly and Dr. Burnham have already with their large quantity of radium shown such brilliant results that it is with more or less reluctance that physicians allow a new experiment to be tried on their patients.

Carcinoma and malignancy in general occur almost invariably in the poorer classes. It has been our experience that carcinoma in a wealthy patient is comparatively rare. At the present time we have undergoing treatment nine cases, all of the dispensary variety. So far we have broken over six tubes for one reason or another, not due, to be sure, to any specific fault of the machine.

We have worked on an average of seven to nine hours a day, and if it were not for the fact that we have been operating two tubes at a time, I do not believe the machine would pay for itself.

Anyone attempting this work without carefully working up his cases, using microscopical sections when possible, carefully studying the blood to ascertain the degree of anemia, etc., will not only not gain results but will in many cases do harm by giving too much treatment and he may cause death by producing aplastic anemia and a curious lung condition, which follows the treatment of carcinoma of the breast, which we are not in a position to discuss at this time.

Dr. William Neill, Jr., Baltimore, Md.—I brought four slides that I would like to show in connection with Dr. Lawrence's paper.

I ask you to pardon me for just a moment for stepping out of the x-ray field to say a word

about radium, which has been found in our hands more efficient than the x-ray in the treatment of mediastinal tumors. As Dr. Lawrence said, these tumors are classified as either malignant or benign, and the malignant ones are classified as either primary or metastatic. The most important point prior to treatment is to arrive at an accurate diagnosis. This can be arrived at by a complete study of the blood, x-ray examinations and, if possible, the excision of a palpable metastatic lymph gland for microscopic study. Radium treatment cannot be carried out satisfactorily in this condition unless a sufficient quantity of radium is available. One cannot hope for any benefit unless he has at least one gram of radium at his disposal as smaller amounts only tend to irritate the skin and have no effect whatever on the tumor, itself.

Dr. C. C. Phillips, Charlotte, N. C.—I have been greatly interested in all these papers on deep therapy and especially the paper presented by Dr. Lawrence because we have a case almost identical with one shown on Dr. Lawrence's slides.

The patient, a merchant, 35 years of age, normal weight 210 pounds, very rapidly lost weight and went down to 160 pounds. He was very anemic. X-ray examination showed almost identically the chest picture that Dr. Lawrence showed. I think if Dr. Lawrence's slides were substituted for the slides of our case you would not notice the difference. A diagnosis was made on this man of lymphosarcoma. We have since been in some doubt as to whether the diagnosis was correct because of the fact that he received a very small amount of radiation, and made such rapid improvement. At the end of three months he was clinically cured and at the end of five months the blood picture was normal and the x-ray plates of the chest normal. At the end of seven months he had regained his normal weight.

In view of the cases just presented by Dr. Lawrence and Dr. Neill I think we shall hold to the diagnosis of lymphosarcoma. It has been more than a year since this patient was treated. We have seen him at frequent intervals and as far as we can determine he is in good health.

Dr. W. P. Whittington, Asheville, N. C.—I want to ask a few questions as to the technic employed by Dr. Millwee and Dr. Moore. Dr. Millwee failed to give us a definite dosage, or his method of treatment. He spoke of giving both methods of treatment without giving voltage, time or distance.

Dr. Moore's paper was very much of the same character, deficient particularly as to voltage, etc.

Dr. Keith's paper was a little more definite but still lacking as to location of the portals of entry.

We have been taught by the old methods when we gave only 85,000 volts with cross fire to save the skin. In treating the uterus we had three or four portals of entrance through the front, the same number over the sacrococcyx and sciatic notches and one through the vagina directly to the cervix. We were able to give 40 to 60 minutes directly focused on this organ. I do not know from the papers of this afternoon just what was given.

In Dr. Lawrence's paper I would like to bring out another question. Nothing has been said about the thymus gland which occupies the upper part of the chest. Had these mediastinal tumors which were cured so quickly any relation to the thymus gland?

Instead of being malignant is it not possible that they were hypertrophied thymus glands? We have had some beautiful cases of thymus involvement which cleared up on x-ray treatment.

Dr. J. J. Clark, Atlanta, Ga.—It is well to remember that there are conditions other than tumors and growths where the x-ray may be of value. I wish to report the case of a child referred to by Dr. Lewis Gaines, of Atlanta, who had a spasmodic cough. It had persisted for five years. The child was ordered out of school because of the cough. He coughed about five times a minute, a hard, brassy, dry cough. Dr. Gaines referred him to me as a possible case of aneurysm or of enlarged thymus. We found nothing of that sort in the chest but each hilus was definitely infiltrated. It was the type that you see with enlarged bronchial glands. It occurred to me that if an aneurysm could produce a cough perhaps glandular pressure on the bronchus might produce the same result. We gave the boy four treatments and the cough disappeared after the fourth treatment. It is now 17 months and the cough has not returned. After missing four years of school he is now attending regularly. Comparison of the chest picture after treatment with the one before showed a complete elimination of the shadow at each hilus. His history in going farther back was one of chronic respiratory infection and measles. He must have had simply a glandular hypertrophy at the bronchi which the x-ray cleared up.

Dr. D. Y. Keith, Louisville, Ky.—In how short a period did you give the series of treatments?

Dr. Millwee (closing).—I shall try very briefly to answer some of the questions. The question of the apparatus was spoken of. We have had no trouble with our apparatus. We have broken one tube in 18 months' time, that is punctured it.

We have tried the method of administering the dose over a week or ten days' time and administering it in 24 hours. It has been our experience that the latter method gives the best results. In our early cases we administered it over a greater length of time because we were afraid to do otherwise, but gradually climbing up we are treating practically all patients according to the latter method.

We must take into consideration at all times the physical condition of our patient. The thing can never become any more automatic than the administration of any other therapeutic measure. A certain amount of quinin will not cure all cases of malaria. There has been a good deal said about the danger of over-dosage and that is to be considered very seriously. Yet we are dealing with a desperate situation in almost all these cases and from observation in most cases of advanced malignancy we have no chance of cure unless we give a sufficient dose early

to bring about a result. Now if in our first dose we are afraid of over-dosage and we come a little below the amount required to cure it, we can hardly refrain from repeating that dose in a short time. Your patient will rapidly get better to a certain point, under the small dose, and then you will see the disease recurring and give further treatment. It has been our experience that repeating reasonably large doses of high voltage x-ray within a period of three months usually does more harm than good. I do not believe that we will produce as much damage to the intestinal tract or to other normal structures by giving 110 per cent of an average erythema dose at one time, as if we gave 90 or 75 per cent of that dose twice. This opinion is based on clinical results. The future may prove it to be incorrect.

The reaction I spoke of in the mucous membrane came on at about the same time as the skin reaction and came on ordinarily in about one week after the administration of the dose. The nervous symptoms have lasted various lengths of time. In one or two cases they lasted two or three months.

I do not feel it safe to do it under five or six months. I would rather wait eight.

I do not believe in blood indications as to when we have a full dose. The blood changes vary to such a degree in different individuals with the same dose.

Purposely I avoided the question of technic because it is very difficult to present in a short time. I do not believe at the present stage of the game that any man putting in x-ray equipment should take somebody else's technic automatically. We have given 110 per cent of the erythema dose to all tissues which we considered involved. One patient may get that dose through two portals of entry. In the neck cases we were usually able to give the full dose of radiation distributed throughout the tissues through two portals of entry. I think it is a good rule to give it through as few portals of entry as possible because the dose is better distributed. In Hot Springs somebody asked me how I got my erythema dose; how many milliampere hours I used. I told him I had given a man 11½ milliampere hours on opposing sides through certain sized fields.

He went home, installed a machine and gave that dose. Another man nearby learned that he had a technic, called him up and asked for it. He was told to give 11½ hours on the front and on the back through two portals of entry. Unfortunately, this man followed this technic. Unfortunately his first three patients were about four inches thick and he gave this dose on each side and killed them. They died from over-radiation. He did not consider the amount of ray passing through to the other skin surface. There are so many factors to take into consideration beside the thickness of the patient that I think every man administering high voltage x-ray should work out a technic which he understands. If he uses certain factors and believes he gets 110 per cent of the dose under certain conditions in fields of a certain size, ten years from now he will be able to go back and see whether he was wrong or not. It is too early to try to teach every one the same technic.

Dr. Moore (*closing*).—I incorporated the technic that I use for treatment in my original paper and then left it out. My reason was that mentioned by Dr. Millwee. Until we establish a technic each individual should work out one for himself.

Of Dr. Waters' experience, I feel that I have a certain appreciation. When all their money has gone elsewhere the patients come to me.

Dr. Keith (*closing*).—As to Dr. Moore's point in regard to patients' coming to us when their money is gone, if the profession knows what we are doing for these cases we will get many of them earlier. Three of our breast cases shown today you will note came early. We had seven or eight cases of malignancy from that immediate neighborhood all of which could be traced as coming from one patient who had been greatly benefited without surgery.

Our apparatus is arranged very similarly to Dr. Millwee's. It is built in one room and there is a hole in the wall, so the patient cannot get an electric shock. We are getting much less nausea than with the old arrangement. We can allow the patients' friends to go about the room and we do not have to watch for their coming in contact with high tension wires. It is more comfortable giving treatments with this arrangement than with any we have seen.

Dr. Ernst spoke of filters. All of us who have been giving radiation for skin lesions have learned by experience and a few by accident what is the better filter, and it is pretty well settled in your mind what you will use. I think it is going to be very definitely settled in the next year what is the better filtration for the different types of tumors.

Dr. Millwee.—One thing I failed to mention is the nervousness noticed after radiation about the face and neck. I think the radiation has an effect on the central ganglion. I wonder if any one has a definite idea about this.

Dr. Lawrence (*closing*).—We have, as you all know, uses for low voltage. I believe firmly that you can get good results with low voltage, but high voltage will do with ease, what low will do with difficulty. It is a question of getting

into the part the radiation that will produce a chemical effect at that point. In surface lesions we have no use for high voltage. All we need is the right method of application. We have a very effective method of treating all surface lesions with low voltage x-ray. The second point is that we do not have all we need in low voltage. We need something to get a deep effect comparable to that which we are getting on the surface. That is what we have been trying to do with high voltage. While we have not altogether accomplished this we have certainly approached it. As to choosing between the old and new, none of you have heard of any man's discarding a high voltage machine and going back to the old. Some men have been using them a year and a half.

High voltage is not quite as "wild" as most of you are inclined to think. The man who put in my machine said, "Doctor, this is wild stuff." I have not been impressed that way.

Before I put in the high voltage machine I had the impression that the first patient that I treated with the high voltage would be in a bad condition when I finished the treatment. The nausea is less than with the old voltage.

Some one said in listening to Dr. Moore's paper that Dr. Moore is not as enthusiastic as he was a year ago. The paper would give that impression. I believe that is somewhat to be accounted for by the fact that the material Dr. Moore has had shifted over into his department has been very poor, and he has tried to make us believe, judging from the photographs, that he does or does not believe in the resurrection of the dead. In well-selected cases I think you will be delighted with the result.

As to technic, I do not quite agree theoretically, I will not say practically, with Dr. Millwee and Dr. Moore. I think we ought to work out a technic to be used by men of average intelligence in this line of work and transmitted from one to another. Just as there is a fine sense of surgical touch and a fine sense of surgical judgment, there will always remain an indescribable quality of x-ray judgment. But a technic can be worked out and should be, which will be put down in black and white so that he who runs may read, but not necessarily translate, with readiness.

TROPICAL DISEASES AND PUBLIC HEALTH

EXTENDING THE HEALTH SPAN AND LIFE SPAN AFTER FORTY*

By Eugene Lyman Fisk, M.D.,
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Is it worth while to extend human life after forty—or at any other age? Of course, this depends to a considerable degree upon whose life one proposes to extend.

If we accept the verdict of most philosophers and intellectuals, ancient and modern, there is some doubt about it. The pessimistic view of life is the rule rather than the exception; witness Euripides' "not to be born is best, and next, to die as soon as possible." Life is discussed by such writers as an enigmatic affliction rather than a divine dispensation. Only Plato, Bruno and a few others have seen a vision of human life on a higher plane of happiness and contentment.

However, if it is not too violent a call on the imagination, we may turn from Plato to George Bernard Shaw[1] and find the latter philosopher demanding three hundred years as a reasonable time in which to complete any important life work. Judging by the way some people work in these days, a thousand years would be nearer the requirement. Perhaps in three hundred years Shaw, himself, would be able to discover America!

How much real value should we attach to the views of the pessimistic philosophers of ancient and modern times, whose diagnoses were based upon a mere consideration of symptoms and an almost complete ignorance of the underlying physical causes of human misery? When one considers that even the most learned philosophers and scientists of a few decades ago were wholly ignorant of the factors of causation in the most important diseases that afflict mankind, we may well be pardoned if we refuse to accept the dictum of these thinkers as to the limitations of human life. Many of them were poisoned both in mind and body and almost wholly ignorant of the physical basis of personality, the material vehicle of life and the mechanism of mind misery.

It was only about fifty years ago, in the age of sewer gas, that the health department of New York City was a subordinate branch of the street cleaning department,[2] and such health inspection as there was at that time, devolved mostly upon saloonkeepers. New York was less efficiently governed in matters of sanitation than the Israelites under Moses.

There is no scientific warrant for the commonly accepted notion that the human life cycle is fixed by some immutable law, and that the miseries endured by man in the course of the ordinary life time are, on the average, fore-ordained. The basis of the health extension and life extension movement is the negation of this pessimistic philosophy, which denies the possibility of materially altering the human life cycle. After divesting our minds of scholastic medieval traditions and clinical pre-possessions, we are impressed by its brief duration in comparison with that of other lesser animals. But the mere length of the life cycle is a matter of minor consideration. We should be chiefly concerned with the condition of the average man at the successive stages of the average life cycle.

The present expectation of life (1920) at birth is about 55 years,[3] probably 20 years more than it was a century ago. In 1855 it was 40 years in Massachusetts and New Hampshire.[4] The expectation of life at the age of 50 is about 21 years (21.54). This is what we mean when we say that the span of human life is about 70 years. Those who survive the perils of childhood and early adult life may look forward with reasonable confidence to living to the seventieth year or somewhat beyond.

In 1789, the expectation of life at the age of 50 was 21.16; in 1901, it was 21.26 years; in 1910, 20.98; and in 1920, 21.54

*Read in Section on Public Health, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

years.[5] In Sweden, Denmark, England, Wales and Prussia the expectation has increased in all age periods in the past half century, but chiefly at the earlier ages. It is notable that in spite of the decrease in the general death rate and the gain of 20 years in the expectation of life at birth, there has actually been no material extension of life beyond middle age in this country in the past century. The Census Bureau has recently called attention to this phenomenon, confirming the thesis on this point maintained by the Life Extension Institute for some years.[6] A recent bulletin, it is true, emphasizes the remarkably low mortality for 1920, showing improved rates at all ages and for the degenerative diseases of middle life, an abrupt downward fluctuation following the high influenza and pneumonia mortality of 1918; but there is as yet no proof that this reflects an underlying favorable trend in the mortality of elderly life. It more probably reflects a weeding out of the organically impaired by influenza and pneumonia. Following the low mortality from diseases of the heart, blood vessels and kidneys in 1919 there was a sharp upward trend in 1920. Dr. Dublin has called attention to the low mortality obtaining for several years in life insurance experience and believes we have turned the corner on the so-called degenerative maladies. But time will tell; and he rightly urges caution in interpreting present figures. What we must bear in mind is that these maladies were sharply on the increase up to 1918 and that there has been no consistent, continuous downward trend in the past decade, but an abrupt and remarkable drop immediately following the epidemic. Already there is noted a sharp upward trend.

MOVEMENT OF MORTALITY

In Diseases of Heart, Blood Vessels and Kidney

Death Rate per 10,000 Living.
U. S. Registration Area.

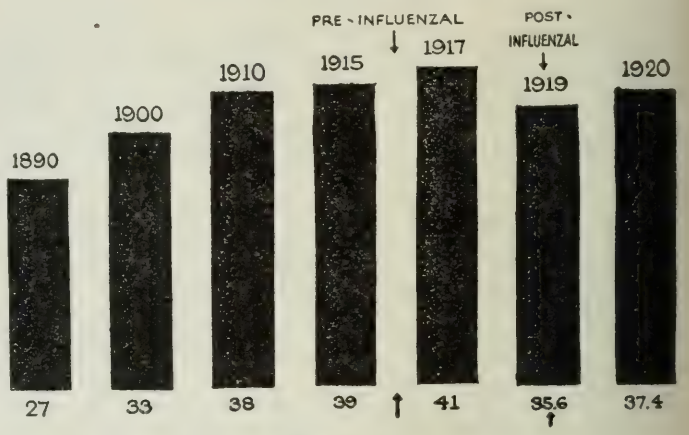

Chart 1.

Likewise, Dr. Dublin reports an increase in the death rate at the ages of 45-64 of 12.3 per cent in 1922 as compared to 1921, largely due to an increase in the rate for the organic maladies (21 per cent).

Notwithstanding our low general death rate, the expectation of life in most civilized countries is greater at birth than it is in this country and still greater at middle life (as shown in the following charts derived from the United States Life Tables just issued):[7]

EXPECTATION OF LIFE AT BIRTH FOR VARIOUS COUNTRIES (Males)

U. S. Census Life Tables 1921

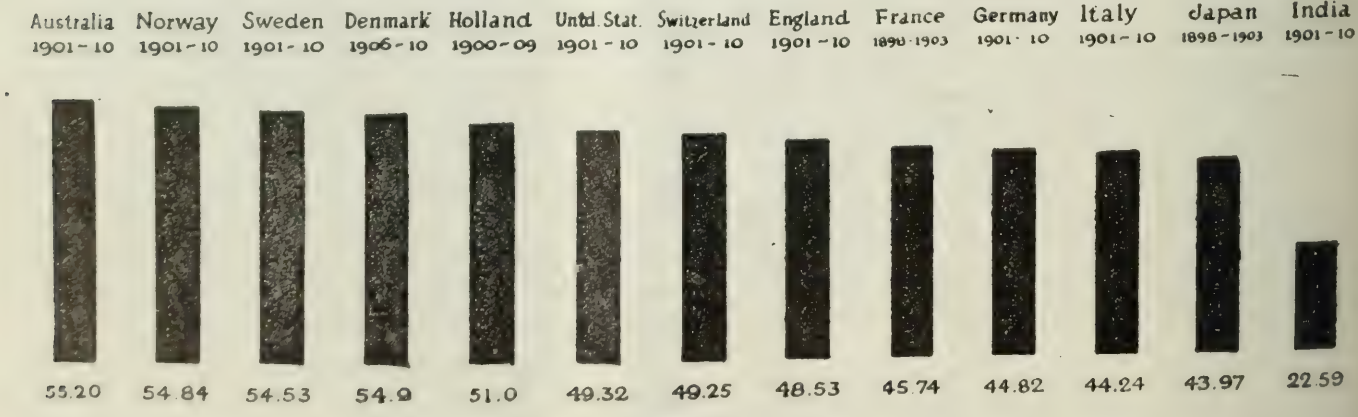

Chart 2.

EXPECTATION OF LIFE AT 45 FOR VARIOUS COUNTRIES (Males)
U. S. Census Life Tables 1921

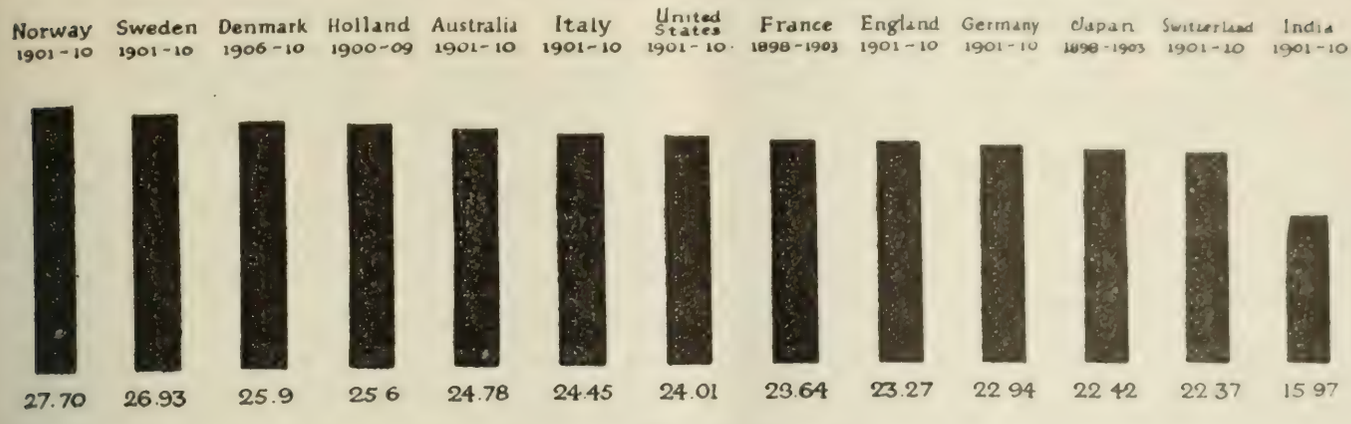

Chart 3.

How much of this period of 70 years is passed in a condition of sound health? There is abundant evidence to show that after the age of 30 the average individual has certain physical limitations which were not present in earlier life. He may be able to live out another 40 years of fairly active life, but each decade brings its physical handicaps and restrictions and before two-thirds of the life cycle has elapsed, we find the average civilized individual a semi-invalid, if we judge him by reasonably high standards of sound health and physical endurance. It is enough to say that at 40 the death rate is nearly three times what it is at 20, and that the morbidity rate increases in consistent ratio; at the age of 20 it is 4.68 per 1000; at the age of 50, 12.76; and at 60, 25 per 1000.[18]

As proof of the non-fixity of the life cycle, we may point to experiments with lower animals, whose life cycles have been materially, indeed, profoundly, altered by scientific means.[8]

As proof of the non-fixity of the health cycle, we have the evidence gleaned from a thorough combing out of the populations of all civilized nations during the war. In these cold-blooded surveys, the degree of obvious preventable or remediable physical deficiency was made clear—this widespread searching of the human race giving testimony strictly in line with the more intensive studies made in industry and in special groups by the Life Extension Institute and other organizations and individuals working along similar lines. The rejection rate for military service likewise increases with each decade, only 11 per cent being accepted for active service in Great Britain at the age of 50 as against 62 per cent at the age of 18. Between the ages of 18 to 42, only 36 per cent qualified for active service.[9]

You may ask, is it possible to change these conditions? Can we do more than register these human defects and deplore them? The answer is that in certain groups where improved hygiene has been at work, as in our schools and colleges, there has been shown not only improvement in health but a very low death rate as compared to that of the general population, and a decided improvement in physique. A study of the mortality of graduates of Smith, Wellesley and Vassar during the past forty years showed a death rate of 3.24 per 1000,[10] or less than one-third that of the general population. Dr. McKenzie has called attention to the improved physique of the students at the University of Pennsylvania; and there have recently been issued very impressive figures at Vassar,[11] indicating an increase in height of 1½ inches, in waist measurement of 2 inches, and in weight of 6½ pounds among students of the present day as compared to those of 1890. Similar physical trends have been shown at Leland Stanford University and at Smith College. Dr. McCastline, of Columbia, has recently commented on the benefits observed from the health supervision of students. At the University of Wisconsin,[12] as the result of medical supervision supplied by the State to students, it was found that

the loss of time due to bed illness had been reduced 40 to 60 per cent and that during the eight years of this medical supervision the university death rate had been reduced to only one-fourth of the general expectant rate.

More direct testimony as to the possibility of health extension and life extension has been found in the recent analysis of the mortality among policy holders examined for the Metropolitan Life Insurance Company by the Life Extension Institute for the purpose of prolonging their lives.[13] A group of about 6000 policy holders was followed from the year 1914-15, during which the individuals were examined, for a period of about five years. On a very conservative basis of actuarial computation, a reduction of 28 per cent in the mortality was shown. The most striking fact, however, was the reduction of 67 per cent in the death rate among those found more or less seriously impaired. This represents the earliest work of the Life Extension Institute and not the most intensive type of work that it has since done along these lines. The people examined were scattered all over the United States and Canada. Many of these examinations were made by general practitioners new to this type of work, that is, to the ideals and standards of health examinations. It is a striking fact that the greatest reduction in mortality was in the age group 40-60, showing the opportunities in the field discussed in this paper. These results are in line with similar mortality statistics derived from a study of a group of several thousand policy holders similarly examined under my supervision in the years 1909-12.[14] A reduction of 50 per cent in the death rate among those found impaired was experienced in that group.

In a report to the Hoover Committee on the Elimination of Waste in Industry[15 17] by the Life Extension Institute these data were applied in the estimation of the economic loss from preventable diseases and ill health in industry. Assuming that the value to the state of the average human life is $5000, the annual loss was figured at $3,000,000,000.*

*DEMONSTRATION OF POSSIBLE SAVINGS FROM HEALTH SUPERVISION AND PERIODIC PHYSICAL EXAMINATION

Expected mortality per 1000 in population examined; conservative figure for average population at work	10 lives
Probable number of sub-standard or physically impaired lives per 1000 in population examined	300 lives
Expected mortality *without examination* per 300 sub-standard lives	6 lives
Probable mortality *with examination* per 300 sub-standard lives	3 lives
Mortality saving (lives per annum) in sub-standard group	3 lives
Add at least one life saved in standard group	1 life
Economic value of average life	$ 5,000
[Formula of Dublin and Whitney based on exact computation of basic factors, increment of wealth, etc. Value of 1 year of life $100 x 50 (average lifetime) = $5000, economic value of average life.]	
Mortality gain to state for each 1000 examined (4 lives x $5000)	20,000
Assuming 2 people constantly ill for each death occurring in group, the saving of 4 lives means the elimination of 8 cases of chronic illness from the group, or a reduction of 8 x 365, or 2920 days of illness. At a medical, nursing and extra diet cost for illness of $3.00 per day, the saving equals about	9,000
Profit to state and community per 1000 of population	$ 29,000
Applying this factor to a population of 105,000,000, which would exclude the extremely aged and infirm, who would not come under the operation of these formulae, we have the following exhibit: 105,000,000 x $29 equals about	3,045,000,000
What would be the cost of applying a system of periodic examination to the entire population? If there were thorough organization of such work the cost would not exceed $5 per individual—a total of	525,000,000
Leaving an economic balance of	$2,520,000,000
Assuming that one-third of the sub-standard cases revealed by these examinations, or about 10,000,000, required medical, surgical or dental treatment at a cost of $100 per case, the cost of this repair work would aggregate	1,000,000,000
Leaving a net margin of economic gain of	$1,520,000,000

Also excess dividends in:
Health;
Happiness;
Satisfaction in living;
Prevention of pain;
Prevention of sorrow;
Prevention of discontent; and
Industrial unrest.

In the same report a number of estimates were made with regard to the prevalence of certain physical defects and disease,[16] which it would be well to consider in this discussion. These estimates were based upon intensive studies of small groups as well as the analysis of large groups in the population, as through the draft examination, morbidity surveys, etc.

A half million working people die annually.

Forty-two million gainfully employed lose 350,000,000 days from illness disabilities and non-industrial accidents annually; 28,000 die from industrial accidents.

The economic loss from the tuberculosis death rate alone is $500,000,000 annually and $26,000,000,000 for this generation, figured on the diminished longevity. At least 1,000,000 people now have tuberculosis.

Twenty-five million in the working classes have defective vision requiring correction. At least 25,000,000 have defective teeth and mouth infection; 8,000,000 have flat foot; 6,000,000 have organic diseases resulting largely from infection; 1,500,000 have venereal infection.

It will be helpful to present a close-up view of certain special groups, which will reveal more intimately the nature of the problems that confront modern medicine in assuming the newer responsibilities that are now being placed upon its shoulders for the prevention of human suffering and physical failure. Please understand that I am not claiming superior diagnostic skill for any one engaged in this work, but simply giving you facts upon which a judgment may be formed as to the strength of the system and the soundness of the principles advocated by the newer and broader preventive medicine as compared with the time-honored medical custom of waiting for people to come and inform us that they are ill—too frequently telling us exactly what is the matter with them—and ask for a remedy.

I shall first analyze a group of 100 post office employes constituting a cross section of the service, who were examined by the Life Extension Institute at the request of the former Welfare Director of the Post Office Department, Dr. Frankel. These examinations were made without charge by the Institute, simply as a scientific and public contribution. These men were put through the full individual routine at the Head Office of the Institute, including x-ray and laboratory studies. The following classification shows the condition of this group:

	No. and Per Ct.
Class 1.—No physical defects	0
Class 2.—Minor defects requiring observation or attention	0
Class 3.—Moderate defects requiring hygienic correction or minor medical, dental or surgical attention	5
Class 4.—Moderate defects requiring medical supervision as well as hygienic correction	26
Class 5.—Advanced physical impairment requiring systematic medical or surgical attention	57
Class 6.—Serious physical defects requiring immediate surgical or medical attention	12

These figures fairly reflect what we find in an average mixed group in the population engaged at work.

Such a classification, however, does not convey a sufficiently clear picture to the minds of people who have not been working in this particular field. I will read a description of certain of the serious cases and a few of those in the other classes:

CLASS VI

Case I.—A man, 37 years old, complained of bronchitis and pains around the heart. He had an old history of pleurisy and x-ray signs of pleuritic thickening. Physical signs and x-ray report suggested chronic tuberculous process. The blood pressure was low (106-70), and he was 30 pounds underweight. His tonsils were moderately buried and cryptic. He had badly decayed teeth and infected gums. He had moderate arterial thickening with a slight enlargement of the heart. He used tobacco excessively, and his diet was badly adjusted. He got too little sleep and had a badly ventilated sleeping room.

Case II.—A man 42 years old had a very high blood pressure (240-150), a definite amount of albumin in the urine, numerous leucocytes, and a low specific gravity. He showed enlargement of the heart and a loud second aortic sound. He

had moderate arterial thickening, some evidences of bronchitis, tonsils enlarged, buried and cryptic. His defective vision was not fully corrected. He had a nasal obstruction, flat foot, and complained of shortness of breath. He was 15 pounds overweight, and used tobacco freely. A Wassermann test was negative, but further examination and anti-luetic observation were advised.

Case III.—A man 54 years old had an elevated blood pressure (182-100), a systolic heart murmur at the apex conveyed to axilla, moderate arterial thickening, extensive mouth infection, and buried tonsils. He complained of occasional rheumatism in the back and knees. The Wassermann was negative, but further anti-luetic observation was advised.

Case IV.—A man 31 years old complained of palpitation of the heart. The heart was enlarged, and he had an apical systolic murmur. He had a low blood pressure (110-78), a marked amount of albumin, and very numerous hyaline and granular casts. His tonsils were enlarged, buried and cryptic, with cheesy masses. He had extensive tooth decay. He was 25 pounds underweight, had slight flat foot and slight double inguinal hernia.

Case V.—A man, 46 years old, complained of rheumatism and "gout." He was 70 pounds overweight. His blood pressure was moderately elevated (150-106). His tonsils were enlarged, buried and cryptic. He had root abscesses of the teeth, rapid pulse and slight arterial thickening, a few cylindroids in the urine, and left inguinal hernia.

Case VI.—A man 47 years old had a high blood pressure (188-110), and was 20 pounds overweight. He had a history of severe abdominal colic. He had right inguinal hernia, a slight hydrocele, and slight anemia. Early operation was advised owing to tightening of the ring.

Case VII.—A man aged 28 had a history of fainting spells. His blood pressure was elevated (160-110), tonsils were enlarged and cryptic; and he had a spot on the right tonsil. He had several impacted molar teeth and moderate arterial thickening. A Wassermann was negative, but anti-luetic observation was advised.

Case VIII.—A man 44 was 60 pounds overweight, had a root abscess, extensive pyorrhea, and blood pressure moderately elevated (146-90). He had moderate arterial thickening, a rapid pulse, and enlarged tonsils. The prostate gland was slightly enlarged. He had chronic nasal catarrh, used tobacco and coffee excessively. Wassermann was negative, but anti-luetic observation was advised.

Case IX.—A man of 32 had a strongly positive Wassermann test, excess of leucocytes in the urine, a root abscess, tonsils enlarged, buried and septic, and was 15 pounds overweight.

Case X.—A man of 31 in an eye examination showed a condition of acute glaucoma. A root abscess was present. This subject immediately sought treatment and operation and the condition was relieved and sight was saved.

Case XI.—A man of 37 had an organic heart murmur, and his heart was enlarged. His blood pressure was increased (160-114), and compensation was only fair. There was a trace of albumin in the urine. Lungs required further observation. He was a lightweight and had lost weight (5 ft. 8½ in., 120 lbs.) An error of vision was not corrected. He had a poor family history and used an excess of tea and coffee.

Case XII.—A man of 32 had a doubtful history of lues with a negative Wassermann. He had chronic diarrhea and enlarged and defective tonsils. Smear and culture are pending, and further gastro-intestinal observation.

CLASS V

Case I.—A man of 47 was 25 pounds overweight. He had enlarged tonsils, buried and cryptic with cheesy masses. His blood pressure was slightly advanced (146-96). He complained of shortness of breath and frequent colds. He required treatment of the nose and throat, reduction of weight, and further observation of the lungs.

Case II.—A man of 35 was 30 pounds underweight, had flat foot, defective vision not corrected and acid dyspepsia. He had a history of empyema of the lungs, though no active condition was present. He had a root abscess in the jaw. He used tobacco and coffee excessively and his diet was badly balanced.

Case III.—A man of 29 had a history of being gassed. He was 10 pounds underweight. A slight enlargement of the heart was shown by x-ray. He had moderate thickening of the arteries, a root abscess in his jaw, and enlarged tonsils.

Case IV.—A man of 41 was 35 pounds underweight. He had a low blood pressure (110-70), moderate thickening of arteries, buried and cryptic tonsils, a nasal obstruction, cloudy antra and polypi in both nares, defective vision, not fully corrected, constipation, indigestion and acid stomach, used an excess of tobacco, and his diet was unbalanced.

Case V.—A man of 31 had low blood pressure (106-70), moderate thickening of the arteries, enlarged and cryptic tonsils, carious teeth, flat foot, constipation, and complained of pain in the back.

Case VI.—A man of 39 was 25 pounds underweight. He had low blood pressure (112-70), a slight heart murmur, probably functional, and occasional irregular heart action. He had a history of diabetes, but no sugar was found in the urine or the blood at our examination. He had an excess of leucocytes, numerous cylindroids, and a trace of albumin in the urine. His tonsils were enlarged, buried and cryptic, and he had two infected roots. He had marked spinal curvature, flat foot, constipation, hemorrhoids, and his cervical glands were slightly enlarged.

Case VII.—A man of 41 had double inguinal hernia, a slight tenderness over the appendix, a history of intestinal colic, constipation, marked

arterial thickening, two infected roots, defective tonsils, and weak feet.

Case VIII.—A man of 62 was 15 pounds overweight, with excess girth. He showed signs of bronchitis, some shortness of breath, a slight enlargement of the prostate gland, defective vision not fully corrected, defective tonsils, and moderate arterial thickening.

Case IX.—A man of 41 was 15 pounds underweight. He had frequent coughs and colds. His tonsils were enlarged and defective, and he had two infected roots. His blood pressure was slightly advanced (142-90), he had a slight heart murmur, probably functional, moderate thickening of the arteries, a moderate varicocele, a slight spinal curvature, and he used coffee and tobacco excessively.

Case X.—A man of 22 was 20 pounds underweight. He had a low blood pressure (104-70), several infected roots, pyorrhea, buried and defective tonsils, defective vision not fully corrected, a nasal obstruction, an incipient hernia, and used an excess of coffee and tobacco.

Case XI.—A man of 23 had a marked amount of sugar in the urine, specific gravity 1030. He had a root abscess in his jaw. His tonsils were buried and cryptic. He was 15 pounds underweight, and his hemoglobin was low (73 per cent).

CLASS IV

Case I.—A man of 32 had one infected root and some pyorrhea, a rapid pulse, frequent colds, nasal obstruction, defective vision, constipation, acid dyspepsia, flat foot, a slight spinal curvature, and used tobacco and coffee to excess.

Case II.—A man of 48 had carious teeth, infected gums, and a discharging sinus in the jaw. He was 20 pounds overweight, and complained of rheumatism and acid dyspepsia. He used tobacco excessively.

Case III.—A man of 26 had several infected roots, enlarged and defective tonsils, was 30 pounds overweight, had flat foot, a slight spinal curvature, acid dyspepsia, constipation, and suffered from headaches.

Case IV.—A man of 30 had a slight enlargement of the heart, moderate thickening of the arteries, was 15 pounds underweight, had buried and defective tonsils, a root abscess in the jaw, a slight varicocele, and flat foot.

Case V.—A man of 43 had defective vision not corrected, suffered from headaches, had a nasal obstruction and cloudy antra, his tonsils were enlarged and defective, and he was constipated.

Case VI.—A man of 45 had defective vision not corrected, infected gums and loose teeth, several infected roots, a nasal obstruction, cloudy antra, buried and defective tonsils, evidences of bronchitis, and frequent colds and coughs.

CLASS III

Case I.—A man of 47 had defective vision, not fully corrected, slight flat foot, a slight varicocele, blood pressure very slightly advanced (140-90), slightly defective tonsils, and used tobacco excessively.

Case II.—A man of 27 had a slight nasal obstruction, slightly defective tonsils, moderate arterial thickening, constipation, slight acne on the forehead, ears obstructed by wax, and used tobacco and coffee to excess.

Case III.—A man of 43 had a slight hydrocele of the left cord, defective vision, not fully corrected, slightly defective tonsils, slight thickening of the arteries, slightly defective hearing, decayed teeth, and some dead teeth.

Case IV.—A man of 33 had slightly defective tonsils, first degree flat foot, ears obstructed by wax, a slight nasal obstruction, and arterial thickening.

This, as I have suggested, gives us a close-up view of human life problems in a group of active workers. It is not the record of a hospital, dispensary or clinic; and that it is a fair picture of an ordinary group of workers is shown by our broad statistics derived from the examination of many other similar groups and a total experience on more than 250,000 people.

Following up this investigation at the suggestion of Postmaster-General Work, the United States Public Health Service has examined a thousand post office employes along the same lines and the findings were entirely consistent with those in the preliminary group examined by the Institute, which affords a striking demonstration of the value of such work for the whole people.

The following comparative table is of interest as showing the high ratio of impairments found in an average working group. The United States Public Health Service followed the same system of classification adopted by the Institute. There was close agreement as to the ratio of serious impairment and the total number of impairments found. The variations in distribution of the other classes may be due to some self-selection in the preliminary group examined by the Institute or to varying judgment in the application of the rating system. The important fact brought out is the high ratio of impairment that is found when the examinations are conducted from the standpoint of the periodic health examination.

The study of this group makes clear the need for a thorough and critical analysis of the human body before physical breakdown or acute disease occurs: the early detection of physical defects, of infection, poisons, and the various factors which in

COMPARISON OF THE RESULTS OF THE PHYSICAL EXAMINATION OF 985 POST OFFICE EMPLOYES MADE BY THE U. S. PUBLIC HEALTH SERVICE WITH 100 EMPLOYES EXAMINED BY THE LIFE EXTENSION INSTITUTE OF NEW YORK

	Results by Classes		Rate per 1000	
	U. S. Public Health Service	Life Extension Institute	U. S. Public Health Service	Life Extension Institute
Class I*	5	0	5	0
II	12	0	12	0
III	258	5	262	50
IV	336	26	341	260
V	234	57	238	570
VI	140	12	142	120

the course of years are responsible for the tissue changes which have erroneously been ascribed to time. I group these factors as follows: heredity; infection; poisons; food deficiency; food excess; air deficiencies or defects; hormone deficiency; hormone excess; physical trauma or strain; psychic trauma or strain; physical apathy or disuse; and psychic apathy or disuse.

If, instead of emphasizing the importance of diagnosis, in the older meaning of the term, and endeavoring to put a label on each patient and classify him as having a disease entity of some kind, physicians will make a careful general survey of the life and the body searching for these factors and giving counsel as to the correction of all defects, as well as to the treatment of so-called disease and the regulation of hygiene, general practitioners of this type would soon arise all over the country and constitute the first line of contact with the public; and the first line of defense against disease and physical failure. They would not stand entirely helpless between the public and a small army of specialists. They would be able to carry their patients along to a point where it could be intelligently determined what special type of follow-up or special treatment were necessary, and their efforts would be directed less toward the mere naming of a disease or the treatment of symptoms, and more toward a discovery of the original cause of the pathology or symptomatology, the mere grouping of which has, in the past, been so satisfactory to science and too often unsatisfactory to the patient.

The chief need is to tear down the emergency ideal in medicine and set up the preventive and constructive ideal.

The importance of this systematic, mechanical, yet intensive and individualistic, examination of the human machine, and the value of this work, when properly systematized, as compared to casual medical consultation, is shown by the following instance:

An individual came to the Institute for the usual health examination. He presented no important symptoms, except severe headache, which had persisted for a year and a half almost constantly. His vision was somewhat defective, 20/50 in one and 20/70 in the other eye. He had spent a great deal of money and most of his time passing through the hands of specialists of various types. At the Institute he had a routine examination. No special examinations were made outside of the usual routine. In the course of this examination certain changes in the eye grounds (choked disc) were found which pointed toward brain tumor. He was informed of the probable conditions and urged to see an oculist, neurologist and brain surgeon. A final diagnosis of brain tumor was made. He was operated upon and a tumor the size of a lemon, an endothelioma of the cerebellum, was removed. This case was exhibited, practically restored to health, at the New York Academy of Medicine in the Section on Ophthalmology, March 21, 1922, and the fact was commented on that while he had been under the observation of a gastroenterologist in a hospital for nearly a month prior to the standard health examination at the Institute, no careful examination of the eye conditions had been made and treatment had been directed toward stomach and other conditions which were, of course, merely functional. Some one had x-rayed his neck and claimed to find a dislocated atlas; a neurologist told him he was going crazy and must keep away from doctors. In the discussion of the case the importance of an eye examination in all cases of illness was emphasized. The important lesson from this experience, however, was the fact that a

*For description of classes, see page 451.

routine examination of this type, without the exercise of any extraordinary diagnostic skill, only reasonable accuracy and a consistent standard routine, had developed evidence of the underlying condition.

There is no reason why a junior physician, inspired with the right ideals and trained to make a complete general survey of the body, should not be able to pick up such evidence very readily by adhering to the routine of a general bodily survey. Conditions which are so obscure and borderline that only a highly skilled specialist could analyze them, should at least be flagged in such a survey and referred for the proper specialized study. For example, in this particular case, even a careful gross test of the vision in connection with a health examination would have inevitably led to a reference of the case to an ophthalmologist and discovery of the condition of the optic disc.

It is quite evident that conditions in medical practice are faulty in so far as systematized provision for human needs is concerned. Hence we see the development of pay clinics, group clinics, and of various agencies of a like nature. I wish to make it clear, however, that the Life Extension Institute, while it bears superficial resemblance to some of these agencies, in many respects is different. It does not undertake the treatment of disease. It limits its work throughout the country to the preliminary physical survey through a staff of 8000 examiners, and while at its head office this survey is made more intensive and is frequently carried to the point of developing complete information, and the work of the general examiner is supported and standardized by specialists, the Institute does not undertake the medical supervision of these cases, but endeavors to solve the problem of the type of medical supervision and hygienic regulation that is required. More than 50 per cent of those examined by the Institute have been referred to their physicians or dentists for attention. In other words, more than 125,000 people have been referred to medical men in no way connected with the Institute for supervision and treatment, which at average professional rates would involve an expenditure of $5,000,000 to $10,000,000.

Another point to consider is the value of these periodic health surveys in solving many of the problems which are now the subject of special drives, such as tuberculosis, cancer, and venereal disease. If this work is properly organized and supporting agencies are developed, if we have prenatal care, careful examination of the pregnant women, proper periodic examination in childhood, in school life and in adult life, either through the family physician trained to do this work, the life insurance company extending it as a privilege in the interest of its business, examinations for employment or for health purposes in industry, examinations in training camps, as suggested by Surgeon-General Ireland, even cancer will feel the influence of this work. It is far better to prevent a disease than to find a cure for it. On this subject alone some statistics may be of interest.

We have a record in the past year of 553 growths, discovered in the regular examinations of the Institute; among these growths, 22 were adjudged malignant. The follow-up of the malignant cases showed that 11 of these were operated and apparently cured and the others are under medical supervision. Seven of the malignant cases were either inoperable or so far advanced that they died after operation. Of the non-malignant cases we have a record of 31 operated successfully, with no deaths. The others are under observation.

Another point of interest is the degree of focal infection that exists. Combining all forms of focal infection, we have found it present in 85 per cent of cases examined, and in every study that has been made a much higher percentage of organic defect has been found in the groups showing definite evidence of focal infection. In root infection of the teeth I feel we are dealing with an important cause of much chronic disease and not with a passing fad.

There is much current dispute over the importance of this type of infection, but in a study of 20,000 dental series made in the x-ray laboratory of the Life Extension Institute, 63 per cent showed root in-

fection. Ninety-four per cent on our advice took the films to their dentists. Seventy-eight per cent had extractions or treatment, or both. Sixty-three per cent of these reported improvement in symptoms or general health within six months. Even though no apparent good effect on health follows the removal of pulpless or infected teeth, we are justified in assuming that the individual has at least been protected against future infection.

It is not strange that the process of adjustment of medical practice to these newer needs should be to some extent painful; but it is my own belief that as medicine reorganizes along these new lines, the work of the physician will be much more satisfying, more remunerative on the average, and I can see in the not distant future a fair prospect of sweeping out of existence many of the noisome quackeries and pseudo-scientific cults which thrive upon public credulity and ignorance. With the medical profession organized to make available to the public in a practical and efficient way existing scientific knowledge, with medical men busy keeping people well and guiding them in the healthful pathways of living, detecting and eradicating their minor defects, or preventing them from becoming major defects, we will have an antithesis of the present condition of affairs where men graduated in medicine are practically ordered to sit in their offices and wait until people fall ill and then knock at their doors, appealing, often vainly, for relief. Is it any wonder that angina pectoris is called the "doctor's disease?"

When these adjustments are made the young physician will serve his time in group associations, where he will divest himself of the medieval notion that he is to be free from supervision or subordination of any kind, constituting himself an individual authority, without a reasonable checking up of his performances. With his training and associations and relationships known by the community in which he lives, with various agencies such as the institute, school, college, camp, industries or insurance companies ascertaining the defects of the people, the vast numbers in the population requiring medical supervision and attention will sift through the hands of this first line of general practitioners into such scientific agencies as may be properly equipped to give service beyond the scope of the general practitioner. But the kind of service most needed, guidance in hygiene and upbuilding health methods, is within the scope of the general practitioner if he will equip himself to render it. It is usually not a function of a group or clinic unless specially organized on life extension principles, where standard methods of interpreting and measuring the significance of physical deficiencies have been developed. Medical treatment and surgery are still the distinct purpose of these clinical groups. It is all important, however, in such work to be guided by mass experience and remember that each individual is subject to the risk of his class.

When one recalls the remarkable advance in medicine during the past fifty years, the splendid work done by special workers in medical research, the enormous advance in sanitation and public health work and knowledge of the causation of disease, and then considers the heartbreaking fight of the general practitioner against terrific odds, largely because of outworn medical customs, one is impressed by the tragedy of this wealth of scientific knowledge not being brought more abundantly and efficiently to the people. There exists at present a gap between scientific medicine and the general public. It is largely filled by quacks and cults and pseudo-scientific get-well-quick fakes. To bridge this gap and throw down the gage of battle to health fakirs of all descriptions and wherever found is one of the central purposes of the health extension and life extension movement, and in this we ask the patient cooperation of all forward-looking educators and practitioners of medicine.

SUMMARY

(1) About 20 years have been added to the expectation of life at birth in this country in the past century; about 10 years in the past two decades.

(2) Most of this gain is due to reduction in mortality under five years of age. Up to 1910, and probably up to 1917, in-

clusive, there was no gain in the expectation of life at the age of 50.

(3) The extremely favorable figures for 1920 may reflect an abnormal and accidental fluctuation. There has been no continuous progressive improvement throughout the decade in the diseases of middle life and old age.

(4) The greatest task and the largest opportunity in preventive medicine lies in the extension of the period of full vitality and in extending the life span beyond the age of 40.

(5) This can best be accomplished by periodic medical examination and the application of scientific methods of health building as well as disease prevention.

(6) Well tested scientific studies of groups coming under the influence of periodic health examinations show a reduction of 67 per cent in the death rate among impaired lives, the largest gains being made between the ages of 40 and 60, clearly showing the neglected field of opportunity in preventive medicine.

(7) The same principles must be followed in clinical medicine, a consideration of the patient's total needs rather than detached consideration of special emergency needs.

(8) This program does not imply the elimination of the general or family practitioner, but requires that he adjust himself to new conditions.

(9) Public health organization, National, state and city, must go forward. Group clinics, health centers, life extension centers have come to stay and will further develop. It is suicidal for clinical medicine to oppose them. But there should be harmonious cooperation among these agencies concerned with health service to the people. Clinical medicine has most to fear from its own reactionary or obstructive tendencies. It has most to gain from open-minded cooperation and a policy of first consideration to the relief of human misery. Under such conditions I foresee clinical medicine enormously extending its power and influence with the people, the breaking down of quackery and pseudo-science and the elevation of the practice of medicine to a much higher economic, as well as scientific, plane.

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DISCUSSION

Dr. Roy K. Flannagan, Assistant State Health Commissioner, Richmond, Va.—This subject is interesting in view of a discussion yesterday as to whether the public health officer is reducing the doctor's income, or, at least, the amount of his practice. It is time for the medical profession to begin to put an anchor to windward and to devise ways and means of fitting itself into the public scheme. This will have to be if we are ever to see the end of our labors. Life extension is distinctly a point of contact with the physician. There is no question that, in the course of time, the preventive idea will be so deeply rooted in the public mind that there will be a demand for less sickness than at present, and a continuing diminution of sickness. If this is a fact, is the doctor gradually to be run off the stage? I do not think so. I think the point that Dr. Fisk brings out is true, that this big

gap between the public and the medical profession will be bridged, and it will be bridged with very much less disturbance between the doctor who does not understand and the public health officer, if the life extension idea is brought to the fore. We need these life extension clinics. We need, as public health officers, to enter this field, but I do not believe we should enter it at the expense of the job we of the South have already undertaken. I do not think we should go too far afield. We have already undertaken the work of sanitation in our rural districts, for instance, and the handling of communicable disease in all its forms and we should not let anything else interfere with this work. But we should begin here and there, where the health departments have compassed their job in large measure, experimenting with this thing, holding these life extension clinics as we can. Certainly, if we do this, we shall be better able to insure ourselves, as public health officers, against the accusation that we are taking bread out of the doctor's mouth.

Dr. James A. Hayne, Columbia, S. C.—As a man of fifty or perhaps more, I am extremely interested in the question of the span of life's being extended. I feel like Bernard Shaw, that it would take at least three or four hundred years to accomplish all the things I want to do, and if anything will give me a year or two more, I want to know of it.

The ordinary fee for a thorough examination by all the necessary specialists now is about $1000. We find that these fees are usually charged. Where is this thousand dollars coming from in the case of the man who has about $2000 a year (which is above the average income in the United States)? Where can he get the thousand dollars? The medical profession says that he must not have any possible help from any source, that the state must not help him, that industry must not help him, that that is state medicine, and the medical profession is unalterably opposed to state medicine in any form. That is a problem which the medical profession has to solve, that part of the profession consisting of the general practitioners and the specialists who are practicing remedial medicine and who deny the right of the state or county or municipality to furnish to their moderately-incomed citizens the possibility of benefiting by modern scientific medicine.

Dr. Robert L. Jones, Nashville, Tenn.—In our health departments we have been rather successful in weeding out communicable diseases. Starting out twenty-five years ago as smallpox quarantiners, we have now gotten to the point where we have taken care of most of the communicable diseases. Dr. Fisk has brought out the idea that we should go into the work of preventing degenerative diseases. So it is incumbent upon us, I think, to broaden our field. How we can do it I do not see just now, except by education.

The second idea is that of another specialty in medicine, the practice of preventive medicine as a specialty, without connection with any city, county, state or national government at all, but for a man to take the position of practicing preventive medicine as a specialty, just as he would practice eye, ear, nose and throat surgery, etc., and encourage his clients to come to him once a year for a physical examination, just as a dentist does, and refer them to the various specialists. That seems to me the proper place for the group, a group of men doing no therapeutic work, either medical or surgical, but simply surveying a man once in six months or once a year and directing him into the proper channels, or ascertaining that there is nothing the matter with him. People should certainly be willing to pay to be told that there is nothing the matter, or to be directed into the proper channels.

Dr. Fisk (closing).—This is one of the biggest problems that faces the civilized world, because, unless we can see our race improve in physical condition, we shall expect a downfall to come. Always, with good vital statistics, when we have found a high typhoid death rate, or a high death rate from any communicable disease, organization has come to meet the problem, and organization will come to take care of these defects revealed by periodic examination.

In our report to the Hoover Committee on the Elimination of Waste in Industry I tried to suggest all possible remedial lines of action. In industry there is a great opportunity. Millions of people can be brought under and combined into an industrial and individual health program, where the expense can be distributed without taking away the independence of the individual. We should eliminate, as far as possible, paternalizing and taking away the individual's independence.

To show the gravity of the problem, I figured that we had advised medical treatment which would cost from five to ten million dollars. More than half the people we examined were advised to go to the doctor or dentist, and I figured that, on a conservative basis, the necessary treatment would cost that amount.

I think the health specialist will come. This is a National question, affecting the health of the whole people.

We not only avoid treating people, but avoid sending them to a particular agency for treatment. It is thought by some to be a cold-blooded mechanical proposition. That is not true, but I believe that many people would prefer something of that kind, something impersonal, to going to a neighbor who will be governed largely by his casual knowledge of the individual rather than by an impartial searching investigation. The health examination is criticised sometimes as being mechanical, but that mechanical feature is one of its advantages. There are many ways to do this work, and the right way will eventually be found. The important thing is to open our minds to the message, and to close them to professional prejudice which will retard progress.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

SURGICAL TREATMENT OF HYPERTHYROIDISM*

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How shall the accurate diagnosis of hyperthyroidism be assured and how shall the patient with hyperthyroidism be protected from an exacerbation of the dangerous factors of his disease by the incidents pertaining to the essential treatment? These are the primary questions which present themselves when dealing with a patient whose outstanding symptoms suggest hyperthyroidism.

As to the diagnosis of hyperthyroidism in general, the order of importance of the diagnostic proceedings is as follows: (1) the history; (2) the physical examination; (3) in doubtful cases, consultation with an experienced internist; (4) determination of the basal metabolism and the Goetsch test; and (5) x-ray examination. In certain cases, however, even when all of these measures have been employed, it is difficult to establish the differential diagnosis with certainty. This is particularly true of early tuberculosis, especially when it is associated with some degree of hyperthyroidism. In some cases the two diseases may develop coincidentally. In such cases an x-ray examination of the chest is of especial value. We use basal metabolism determinations and the Goetsch test in borderline cases, although we do not consider them either pathognomonic or diagnostic. The Goetsch test in combination with the basal metabolism determination is valuable but not specific evidence.

Is the basal metabolism rate a guide to operability? At Lakeside Hospital, in one series of over 500 operative cases, basal metabolism observations were made before operation, but the figures were not given to the surgical group, their judgment as to the operability being made independently on clinical grounds. In this group we found that in many cases judgment based upon the basal metabolism rate would have led to fatal error. The basal metabolism rate in either an old or a young patient does not tell whether or not the patient is emaciated; it does not tell the blood pressure; it gives no information regarding the condition of the kidneys; it does not determine the degree of nervous instability; it tells nothing of the condition of the myocardium; it tells nothing as to the degeneration of the liver; it tells nothing of the psychic state; it does not tell whether the patient is sleepless, or what is the degree of his prostration; and it does not tell whether acidosis is present or pending. All these conditions must be taken into consideration.

The basal metabolism determination, therefore, is but one link in the chain of evidence. We have operated upon many cases in which, despite the fact that the basal metabolism rate was normal and the Goetsch test gave a negative result, a diagnosis of hyperthyroidism was made, the operation performed and the patient relieved of his symptoms.

The sequence of events in two cases recently operated upon on the same day illustrates well the uncertainty and danger which may result if the basal metabolism rate is used as a determining factor among the indications for operation. One of these patients had a basal metabolism rate of only 25, yet she almost died after the ligation of one of the superior thyroid arteries. The other patient had a basal metabolism rate of 90, yet she bore a thyroidectomy without previous ligation and without any untoward result. In our clinic the decision as to the indicated op-

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eration is determined by clinical judgment.

As to the surgical management of the patient, the possibilities, not the probabilities, are the guide. Some years ago, one patient, in an apparently early stage of the disease, was taken to the operating room for operation. On arrival she became very emotional and was returned to her bed without operation. This patient died that night from hyperthyroidism. Since then no case of hyperthyroidism has been taken to the operating room unanesthetized. For a time the anesthetic was given to the patient in bed; he was taken under anesthesia to the operating room and was returned to his bed before the anesthesia was discontinued. In this way the psychic factor induced by the trip to and from the operating room was excluded. Still, however, a severe cycle of acidosis occasionally followed operation. In one instance the condition of the patient taken to the operating room under anesthesia was not satisfactory and the patient was returned to his bed under anesthesia. A severe cycle of acidosis developed, making it clear that the anesthetic itself is an important adverse factor.

In operations for hyperthyroidism, therefore, both the length of the period of the anesthesia and its depth must be reduced to the lowest possible minimum. Instead of taking the patient to the operating room, the operating room is taken to the patient, that is, the operation is performed in the patient's room without moving him from his bed; and the anesthesia does not pass beyond the stage of analgesia. This, in addition to local anesthesia gives the utmost protection during the operation itself. As a routine, all ligations are done in the patient's room and we have also performed 881 thyroidectomies without moving the patient from his bed.

However, despite the above precautions,—control of the psychic activation by the elimination of the trip to and from the operating room; the protection of the internal respiration by the control of the inhalation anesthetic, i. e., by the use of nitrous oxid analgesia; and the elimination of traumatic stimuli by means of local anesthesia,—in some cases there may still be a grave post-operative reaction. It must be borne in mind that in these cases the sensitization of the patient applies to all stimuli, psychic, traumatic and chemical. The reaction to the absorption of wound secretion which, in an unsensitized patient, might result in a rise in temperature of from one-half to one degree, in the hypersensitized patient with hyperthyroidism, might result in a rise in temperature of three, five or even nine degrees. In a doubtful case, therefore, the wound is left open and dressed with plain gauze for the first twenty-four hours after operation, when it can be closed with safety, or, as is usually done now, a large flavine gauze drain is inserted and removed in from six to twenty-four hours.

We have referred above to the protection of the internal respiration by not allowing the anesthesia to pass beyond the stage of analgesia. But this is only one measure to that end. The protection of the internal respiration means that the cells must not only be protected against further depletion as a result of psychic stress, physical trauma, absorption of wound secretion or anesthesia, but must also be assured of an abundant supply of water and of oxygen. This means that an abundant supply of blood per minute must pass through the essential organs. One may readily fail to appreciate the great loss of water through the skin in these cases and that because of his raging metabolism the patient with hyperthyroidism requires much more water than the normal individual. Therefore, if enough water cannot be given by mouth, then, under the protection of local anesthesia, from 3000 to 4000 c. c. of water may be given subcutaneously each twenty-four hours as the condition of the patient may indicate. This is done routinely in all bad risk cases until a water equilibrium is established.

But water alone may not re-establish the failing circulation in the vital organs. In doubtful cases the most efficient agent for the protection of the internal respiration is the transfusion of whole blood. A pre-operative transfusion, therefore, is part of the routine treatment of all patients in whom the hyperthyroidism has

produced great emaciation, a failing heart, fever, exhaustion, etc. The transfusion is done in doubtful cases as a prophylactic measure on the same principle as that applied in preventive medicine, the application of the protective measure in advance of the emergency.

The internal respiration demands not only an abundant supply of fluid, but also that the circulation of that fluid be at a sufficient rate to assure adequate oxygenation of the cells. Thus, a weakened myocardium or failing compensation of the heart may lead to serious suboxidation because of the diminished volume of blood per minute supplied to the vital organs. As a protection against this menace, digitalis in 2 c. c. doses every four hours for ten doses, or until nausea appears, is given. This medication is repeated if required. It should be emphasized that each of these protective and restorative measures—the subcutaneous infusion of water, the transfusion of blood, the digitalization of the heart—is given once only, or repeated according to the possibilities of the individual case. The possible need of the cells in the individual patient is the criterion whereby the management of that case is directed. By the application of the fundamental principle that the welfare of the patient depends upon the maintenance of the internal respiration of the cells, we have been able to operate upon any patient who is not actually in the stage of dissolution.

It is important to realize that the management of these patients cannot terminate with the period of hospital care. Adherence to a carefully planned post-hospital regimen, the protraction and details of which, like those of the hospital period, are strictly individualized, is necessary.

Our management of the patient with hyperthyroidism may be summarized briefly as follows:

(1) *Avoidance of Delay.* — Postponement of the surgical treatment may mean a dangerous progress of the disease with increasing involvement of the myocardium, the kidneys, the liver and the whole mechanism of the patient.

(2) *Pre-operative Period.*—Restoration of the internal respiration of the cells of the organism by a controlled environment; water by mouth and by hypodermoclysis; transfusion of blood; and digitalis.

(3) *Operation.* — The ligation, and, when indicated, the thyroidectomy in the patient's room; nitrous oxid analgesia; local anesthesia; interrupted operation or delayed closure when indicated.

(4) *Post-operative Hospital Period.*— Rest, controlled environment, and repetition of restorative and protective measures if indicated.

(5) *Post-hospital Period.*—For at least six months, under the supervision of the patient's physician, a hygienic regimen planned with especial reference to psychic environment, rest and diet.

In my personal series of 777 thyroidectomies, performed during 1922, 422 were for hyperthyroidism, 348 were colloid goiters and adenomata, and 7 were malignancies. Since the adoption of this plan of management I have performed 2644 thyroidectomies. Among 1495 for hyperthyroidism, there was a mortality of 1.2 per cent; and among 1047 ligations there was a mortality of 0.69 per cent.

What benefits may the patient expect as a result of surgical treatment? In every case of true hyperthyroidism the patient may expect an immediate, striking and fundamental relief from his symptoms.

What of the later results? If the patient is relieved of all infections such as infected tonsils, infected teeth, etc., if autointoxication is relieved, if there are no continuing sorrows or psychic disturbances, and if there is no overwork, then the patient may expect and will receive permanent relief. Even if any of the foregoing adverse factors continue, there will still be improvement.

Not only does operation offer less risk to life than is borne by the disease, but there is also a resultant relief which is immeasurably more prompt than that which follows the long, uncertain and economically adverse rest cure. Operative treatment by cutting short the disease cuts short the progressive deterioration of the vital organs — the myocardium, brain, liver, etc. This in itself gives operative treatment an advantage over the rest cure, for if the rest cure fails to re-

lieve, the amount of permanent damage will probably increase during the interval. Operation is also more satisfactory than radium or x-ray treatment with its uncertain primary effect and tendency to relapse.

Taking into account the slight primary risk and the promising immediate and remote results of operation, we now consider in the case of hyperthyroidism as in that of appendicitis that the indication for operation is diagnosis.

IDIOPATHIC NEPHRALGIA*†

By J. T. Geraghty, M.D.,
and
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The term "nephralgia" has been used to designate a considerable group of cases in which more or less severe pain is present in one or both kidney regions for which no definite cause can be assigned. Pousson calls attention to the existence of a form of chronic nephritis, in which pain by its intensity overshadows all other symptoms. He has made a great number of clinical observations in which the histological examination of a piece of renal tissue removed during the course of surgical intervention has shown the existence of chronic inflammatory lesions. He believes that practically all cases of so-called essential or idiopathic nephralgia if sufficiently investigated would prove to be chronic nephritis. Israel published a work in 1899 devoted to the study of inflammatory affections of the kidney and declared in his conclusions that undoubtedly they were mere cases of nephritis in which renal colic occurred simulating identically the symptoms produced by calculus. In 1902, Rovsing endorsed the views of Israel that chronic nephritis may be accompanied by severe and persistent pain. This opinion was further substantiated by Albarran and Poirier who reported before the French Society of Surgeons their observations of cases of chronic nephritis associated with violent pain with or without hematuria.

The majority of writers on this subject attribute the pain to pressure resulting from sclerosis of the fatty capsule. In some cases there exists what may be termed a pachycapsulitis. Pousson is of the opinion that the pain in these cases of chronic nephritis results from lesions of the renal nerve plexus and its ramifications in the renal parenchyma. In two cases of nephritis Klippel has found inflammatory lesions of the renal plexus and the nerve filaments accompanying the renal arteries and veins. Frugoni who has also studied this phase of the subject has frequently although not constantly found alterations in the renal nerves.

In the great majority of cases of chronic nephritis associated with pain there exist, in addition to the pathological findings of the kidney proper, lesions of the same character in the fatty capsule, that is to say, a perinephritis. Rovsing has particularly called attention to this condition and he attributes to it the essential role in the pathology of these pains. In all of these cases described in the literature in which renal pain is mentioned as a prominent symptom, pathological conditions have been found either in the urine, in the histological examination of the kidney or there has been present a gross perirenal sclerosis on surgical exploration. Kolischer has recently called attention to a group of cases in which pain was a prominent and distressing symptom and in which all the data obtained by examination was negative. On exploring these cases there was found in each instance gross perirenal sclerosis and in some cases the perinephritis was associated with periureteritis. Freeing of the perirenal and periureteral adhesions was followed by complete relief of symptoms.

In all of the cases reported in the literature which we have been able to find in which a diagnosis of nephralgia has been made there has been present some pathological condition of the renal parenchyma, pelvis or perirenal tissues. Many ingenious hypotheses have been advanced to explain the pain caused by the associ-

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*From The James Buchanan Brady Urological Institute, Johns Hopkins Hospital.

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ated pathology but the majority of them have little basis for their acceptance. We wish to report a small series of cases characterized by frequent and intense pain in the kidney in which by all modern diagnostic methods, nothing abnormal could be found either on clinical examination or surgical exploration.

The first case in which a diagnosis of idiopathic nephralgia was made was seen in 1912. This patient, a man of 38 years, had suffered from a constant dull aching pain in the region of the left kidney for a period of eight years prior to his admission to the hospital. The pain while never so severe as to incapacitate him entirely, prevented him from performing the duties of his occupation. The pain was always confined to the region of the left kidney and never radiated. It was not accompanied by nausea or vomiting, fever or sweating. There was no history of hematuria or the passage of sand or calculi. On different occasions during the course of the illness, operation for the cure of hernia, varicocele and hydrocele, were performed in the hope that these conditions may have played a role in the production of the pain which, however, was unrelieved. A thorough urological examination was carried out with completely negative findings. Because of the persistence of symptoms and the patient's incapacity for work, exploration of the left kidney was decided upon despite the negative findings. The kidney and upper ureter were freed from the surrounding tissue and carefully inspected, but nothing abnormal was found. The kidney was not opened but was simply replaced in its former position. The wound was closed without drainage. The relief of pain was immediate and when heard from six years later the patient had remained entirely free of his former pain and was able to perform his work of pullman car conductor.

The brilliant result obtained in the above case called our attention to the existence of a condition to which we have given the name idiopathic nephralgia, and the possibility of relieving by a simple operative procedure cases of a similar nature.

During the past ten years, 17 other cases have been seen in which after exhaustive diagnostic studies no pathological condition could be demonstrated and the diagnosis of idiopathic nephralgia has been made by the elimination of all other possible factors. Of these 18 cases, 12 have been in men and six in women. Twelve cases have been operated upon, the operation in each instance consisting of a freeing of the kidney and upper ureter, the kidney being finally replaced in its former position. Rovsing has given to this operation the name "nephrolysis."

The ages of these patients have ranged from 21 to 58 years, there being in the third decade 3 cases; in the fourth, 9; in the fifth, 5; and in the sixth, 1. The duration of symptoms ranged from six days to 22 years, ten cases being one year or less, one case between one and two years, two cases between two and five years, three cases between five and ten years, one case between ten and 20 years, and one case over 20 years.

SYMPTOMATOLOGY

The invariable and predominating symptom of this group of cases is pain located for the most part in the region of the kidney involved. The pain is usually dull and aching in character and is referred either to the corresponding lumbar region or upper abdomen. It rarely radiates along the course of the ureter or into the testicle and in this respect differs from the characteristic symptom of an obstructing calculus of the pelvis or ureter. The discomfort may be constant or paroxysmal, the attacks of pain being often induced by sudden jars, lifting, etc. During the attack relief is sometimes afforded by the application of pressure to the renal region and many patients experience great comfort from lying on the affected side. There is sometimes a recurrence of the pain when the position is shifted to the opposite side. The pain, as a rule, is not of the severity of that occasioned by stone. The following case, however, is a striking exception to the rule.

This patient, a nurse, aged 38, had for a period of three years suffered from pain in the region of the left kidney. The attacks gradually increased in frequency and intensity and during the three months prior to being seen by us in January, 1920, the patient had been bed-ridden. The pain was frequently unrelieved by enormous doses of morphia at which times temporary cessation of the paroxysm was obtained by the use of chloroform. The plain x-ray and pyelogram showed no abnormality and the only pathological finding was a systolic blood pressure of 200.

The diagnosis of idiopathic nephralgia was made by the process of elimination. The kidney and ureter were freed from their surrounding tissues and dropped back into their former position. Nothing abnormal in their appearance or attachments was noted. The result of this procedure was most striking in that the pain of such long duration and intensity was promptly and completely relieved. This patient has since this time had no recurrence of pain.

DIAGNOSIS

The diagnosis of idiopathic nephralgia is made with reasonable certainty by the employment of the various methods used today in urological diagnosis. It is arrived at by a process of elimination whereby the existence of all other possible factors, such as stone, hydronephrosis, ureteral stricture, infection, neoplasm, etc., can be ruled out with certainty. Although the pain of typical nephralgia differs from the usual colic occasioned by calculus obstruction in its lesser intensity and the fact that it rarely radiates, the danger of overlooking small calculi, which are not revealed by x-ray or of misinterpreting shadows cast by structures extraurinary, calls for the employment of all the diagnostic methods at our command. Studies of the urine from the affected side, the plain x-ray and pyelo-ureterogram and the passing of the wax-tipped bougie should in all cases give normal findings before the diagnosis of idiopathic nephralgia is entertained. While it is quite true that one may overlook in his examination a pathological condition such as a small ureteral calculus and thus arrive at the diagnosis of idiopathic nephralgia, it occasionally occurs that a pathological condition is diagnosed when the case is really one of idiopathic nephralgia. The following case is illustrative of this point:

The patient, a physician of 35, was admitted in 1915, with the history of left renal pain of one year's duration. The pain while never severe was more or less constant and of sufficient annoyance to incapacitate him for active work. The pain never radiated and there was no history of hematuria. The urine was perfectly normal and the renal function as determined by 'phthalein was normal and equal on the two sides. The x-ray showed a very definite shadow 1.5 cm. in diameter apparently in the kidney substance. The diagnosis of stone seemed certain. The kidney was opened from pole to pole and a careful search failed to reveal the presence of calculus. The shadow mistaken for calculus, which is still demonstrable, is most probably a calcified gland. It is interesting to note that following operation there was complete relief of the discomfort of which the patient had suffered and the case operated upon through error for a supposed renal calculus unquestionably falls into the group of idiopathic nephralgia.

RESULTS

In 12 cases the kidney was explored surgically. In 11 of these the kidney and upper ureter were freed of their surrounding tissues and dropped back into their former position. In eight of the ten cases the relief following nephrolysis has been complete and permanent. In one case a nephrotomy was done because of the suspicion of stone. This patient has remained well for a period of six years.

CONCLUSION

The object of this communication has been to call attention to the existence of a not uncommon condition characterized by pain in the region of the kidney, often of a severity which incapacitates the patient and in which no pathology can be demonstrated. To this condition we have given the name "idiopathic nephralgia" because there is no known pathological condition explanatory of the symptoms. While nephralgia in association with chronic nephritis, perinephritis and periureteritis has been described by numerous authors the above group of cases is noteworthy in that no demonstrable pathology is present. The diagnosis should only be made after the most painstaking examination by modern diagnostic methods and is arrived at by the process of elimination. Where the symptoms are of sufficient severity to warrant surgical interference a thorough freeing of the kidney and upper ureter of all the surrounding tissue followed by replacement of the kidney in its former position has in our experience given most gratifying results.

DISCUSSION

Dr. Montague L. Boyd, Atlanta, Ga.—Dr. Geraghty may have stated whether or not the pain was reproduced by overdistension of the pelvis of the kidney, but I did not hear him. I would like to ask him about it.

Dr. John T. Geraghty, Baltimore, Md.—In some cases the reproduction of the pain by overdistension of the pelvis is very misleading. Only occasionally one can depend upon the patient's statement in these cases. In a few cases you can, but in my experience an attempt to reproduce pain in the kidney pelvis and get anything out of it that is of any value has not been very satisfactory.

Dr. Montague L. Boyd, Atlanta, Ga.—My opinion has been that pain in cases of nephralgia

was due in most instances to congestions of the kidney with or without thickening of the kidney capsule, the pain being due to stretching of the capsule. That conclusion seems to be borne out by the frequency with which hematuria accompanies the nephralgia and the relief of pain and hematuria after the decapsulation of the kidney.

Certainly they are not a very well understood, but a very interesting, group of cases and I believe that we are justified in believing in the theory that part of them have their symptoms from intermittent congestions. If anyone doubts the ability of the kidney to enlarge as the result of congestion, all he needs to convince him is to see some of the acute pyelonephritis or pyonephrosis cases which come to operation. Very often as soon as the incision is made through the muscles and fasciae the kidney almost bulges out into the wound because of the enlargement, a great part of which is the result of congestion.

Dr. H. W. E. Walther, New Orleans, La.—I am particularly interested in Dr. Geraghty's communication because I have three of these cases on hand and it is very troublesome for me to know just what to do for them.

He mentioned the freeing of the kidney. I take that not to mean decapsulation but just freeing it of the perirenal fat and so on. Of course, these were not cases where the kidney was removed and submitted to the laboratory for study centimeter by centimeter and inch by inch by the microscope. Every year we bring up this subject in relation to hematuria and someone contends that these are cases of nephritis; that the idiopathic cases are idiopathic only because we cannot demonstrate the causative factor; and that it was there but that we missed it. I feel sure that no other diagnosis can be made except idiopathic nephralgia in many of the cases such as Dr. Geraghty reported. If we get relief from the operation we have justified ourselves, not only in the eyes of the patient but with our confreres. I have learned a good deal from this report and I feel that if the cases I have now do not respond soon I shall recommend the procedure Dr. Geraghty has suggested. However, I still maintain that in a good many instances the results will not be quite so satisfactory as those Dr. Geraghty has experienced in his series and that some of these kidneys ultimately will have to come out.

Dr. W. J. Wallace, Oklahoma City, Okla.—I wish to report an experience which I had with a case about eight years ago, a man about 54 years of age, referred to my service with a pain over each kidney of an indefinite nature, which increased upon exercise. This caused us to suspect stones. Our x-ray equipment was very inadequate at that time and after we had failed to locate a stone by radiography, we decided to operate anyway. The right kidney was exposed first, but we were unable to palpate or locate a stone. I simply did a decapsulation and replaced the kidney, treating the left kidney in the same manner. The old man made an uneventful recovery and is living today and free from pain. I never attached much significance to his case until hearing this paper. I would like to know if Dr. Geraghty did a decapsulation in his cases. If so, I did not understand it that way.

Dr. Irving Simons, Nashville, Tenn.—Dr. Geraghty in his extremely clean-cut paper has made it plain that he is dealing with only one class of cases. As I understood him, he is not dealing with the essential hematuria that is painful. We all know that there are cases of that type and we also know that there are kinks in the ureter which cause pain and also nephroptosis which is painful, but as I understood him he is dealing with the cases in which every diagnostic means has been employed and nothing found to account for the pain. The question is, what is the cause of such a painful kidney. We all know there is such a thing as a sub-acute pyelitis. We also know that there are cases that have pyelitis, which clears up before they come to the urologist, but which still have tender kidneys; and I think these cases fall into the type of nephralgia of bacterial origin. I have seen several cases and have had an opportunity to operate upon them. One case was that of a Marine that I operated upon at Norfolk during the war. He had a very painful kidney, so painful that it was impossible for him to do any work. He came to the hospital several times with retention of urine and was put down as an hysterical patient. Finally, in despair, we did a nephrolysis and he was completely cured. In this case I did not suture the kidney to the loin.

I followed two cases of painful kidney after pyelitis and found that the kidney still remained painful although the urine was bacteria free for several weeks. In one case the pathologist incorrectly reported tubercle bacilli in the urine and because of this I removed the kidney. Examination showed the typical acute nephritic degeneration of the glomerular structures and also of the tubules. In another case I was unable completely to sterilize the right kidney although the left was completely sterilized. After several months, fearing that the woman would become a morphin addict, I was forced to remove the kidney. This also showed evidence of acute nephritis all through the kidney. In another case where there was hematuria for several weeks the symptoms indicated operation, as all the other signs were negative, and in that case I did a silver wire nephrotomy. That kidney was sutured to the abdominal wall and the patient made a good recovery. A specimen of this kidney also showed the same acute degeneration of the kidney that had occurred in the other cases. I feel that in some cases it is probably of value to suture the kidney to the abdominal wall. I think it should be done wherever there is redundancy of the ureter.

Dr. Henry S. Morris, Nashville, Tenn.—A young girl, aged 18, came to me and was treated for what seemed to be acute pyelitis. She had fever, pain and there were colon bacilli in the urine, but through constant work and ureteral

catheterization she quieted down and after that time we absolutely eliminated everything. There was no pathology left except the pain over the region of the right kidney. This continued after frequent micturition stopped and x-ray and pyelogram showed everything negative. The case was sent to the hospital and a nephrectomy was done. Since that time the patient has regained her weight, has rapidly improved and got well with no trouble whatsoever.

I have in mind two other cases more of the type of Dr. Geraghty's. One was a 45 year old man who had had syphilis ten years before. He had received the classical treatment. He came in and was thoroughly examined because of pain in the left kidney. The pain had continued but his urine was negative on catheterization. X-ray and every urological diagnostic means was used to eliminate every sign of pathology. This patient is still suffering. He has been examined a number of times to find out if the syphilis has produced any sclerotic changes. Perhaps it has but I think this is a case of idiopathic nephralgia and I shall certainly advise the patient to undergo some operative procedure.

The other patient was a lady, married, aged 45, who had suffered for 15 years with this pain. Both of these cases were relieved temporarily by lying in certain positions on the side. The second patient still suffers also and is going through the same process of elimination. We have been unable to ascertain anything that looks like pathology in the case and I believe it is a case of idiopathic nephralgia. At least it will have to remain so until we get some other cause.

Dr. J. H. Smith, Memphis, Tenn.—This is an interesting topic to us urologists. I believe in the last few years we have not seen so much idiopathic nephralgia as we formerly did. Formerly there was a great deal of propaganda going on by patent medicine concerns and everything advertised in the papers was a cure for kidney disease. At that time we saw a lot of cases with symptoms simulating pathology in the kidney and upon examination we found no pathology. I now have a case that I have put through the usual kidney tests and can find no pathology in the kidney. The x-ray picture showed a few spots that we took to be small calcareous glands. We first thought they might be stones but we afterward attributed them to small calcifications in the intercostal blood vessels and the pain I attribute to them and not any condition in the kidney. This patient is over 50 years of age. Dr. Geraghty did not state the average age at which nephralgia is present. I should also like to ask what was the percentage of females to males in his cases of nephralgia.

Dr. Stratton E. Kernodle, Oklahoma City, Okla.—I would like to ask how the patients are getting on that were operated upon.

Dr. Geraghty (closing).—Of the 18 cases reported, 11 were operated upon. There were two complete failures. The pain in both these instances was rather severe and the patients apparently had no relief. Nine of the 11 cases apparently have remained well. The proportion of men to women has been 12 men to six women. The data on the cases not operated upon is not very clear. I know that three of the patients are still having symptoms, recurrent attacks of pain and discomfort. In all of the cases we have selected for operation we have tried to be careful only to do those that seemed to warrant some surgical procedure. The simple complaint of pain in the kidney region was never an indication for this procedure. They had to have very distressing symptoms before we carried out the procedure. The operation was simply freeing the kidney, not decapsulation. In one case a nephrotomy was done because of a mistaken diagnosis of stone.

As to the pathology, we are completely in the dark. Granting that some of them might have an undiscovered nephritis, that adds nothing to our knowledge of the condition. Nephritis with nephralgia is uncommon; cases of infection without nephralgia are common. So it might be that nephralgia even in a case of pyelitis or pyelonephritis might even be a mere coincidental phenomenon.

TREATMENT OF A PROSTATIC TUMOR WITH DEEP X-RAY THERAPY*

By Paul J. Gelpi, M.D,.
New Orleans, La.

The subject of this paper is a patient 81 years of age. It has been my rare privilege to have him under observation for 20 years. I do not propose to give you all the details of his voluminous history, but shall confine myself to the more salient points bearing upon the case.

History.—He first consulted me for early symptoms of prostatic hypertrophy. His prostate was moderately enlarged and soft. Massage and boracic irrigations relieved the symptoms. In due course of time, they returned periodically and in more aggravated form. The prostate increased in volume and attained the size of a lemon. The residual urine at that time was about 8 ounces. Notwithstanding routine treatment, the crises became more frequent and were attended with retention.

Finally, 14 years ago, his condition was such that something radical had to be done. A Bottini was decided upon and was performed under spinal analgesia. This was followed by a marked relief of the symptoms and the residual urine was reduced to less than three ounces.

For years afterward, the patient enjoyed a life of comparative ease. About 4 years ago he

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had a severe vesical hemorrhage, which was stopped with bladder instillations of argyrol and the administration of ergot and adrenalin. This was followed by other hemorrhages at intervals of 6 or 8 months, which were also readily controlled. In February, 1922, bleeding again occurred, and although it was less than in previous hemorrhages, it was almost continuous. From February to August only an occasional day passed without the presence of blood in the urine. The urine became foul, frequency was pronounced and the smallest accumulation of urine in the bladder caused severe pain which was accentuated at the end of micturition. The pain increased and was compared to that produced by contact with a hot iron. There was progressive loss of weight and cachexia.

Treatment.—We are told that the effect of the deep x-ray upon the tissues is twofold. It destroys the cancerous cells and promotes fibrosis. It is said to cause a shrinkage of large soft hypertrophied prostates, but to be of no value in the hard fibrous types.

The German and American methods of dosage have some points of difference. The German method has the same voltage and less amperage. The doses are larger and only one or two massive doses are administered. The American method has the same voltage, but more amperage. Fractional doses are given extending over a period of several days.

Two series were given in our case with the deep x-ray machine with a voltage of 200,000 and an amperage of 6. The distance of the tube was 50 cm. The rays were filtered through 1 mm. of copper and 1 mm. of aluminum. The American method was used and the first series consisted of 90 milliampere minutes administered in the fractional doses, three anteriorly and three posteriorly: one application August 22, two August 23, two August 24 and 25, making a period of five days. The second series of 1180 milliampere minutes was divided into six treatments, three anteriorly and three posteriorly, and extended over a period of six days. I am indebted to Dr. L. Foriter and Dr. T. T. Gately for the cystograms and the application of the deep x-rays.

Fig. 1.—Tumor before first deep x-ray treatment.

Per rectum the prostate felt as large as a good size orange, and fairly filled the bowel. The diagnosis of malignancy imposed itself. Unfortunately, the patient's age and the presence of two tight urethral strictures precluded the possibility of a cystoscopic diagnosis.

The hypodermic alone offered the hope of temporary relief, so I determined to try the deep x-ray therapy which had recently been introduced in Hotel Dieu.

A cystogram was made, which distinctly showed a large tumor of the prostate (Fig. 1). A solution of 25 per cent sodium bromid was used.

General Condition.—In the first series, the temperature showed no change except on the first day. It went to about 100 and was probably due to nervousness. In the second series the temperature was practically unaltered throughout.

Pulse.—The patient's normal pulse was about 80. It was more rapid on the second day of the first series, going to 108, and it gradually went down to normal on the last day. During the second series the pulse ranged between 72 and 88. The patient was on a low diet.

Urine.—In the first series, there was much pus and albumin up to 6 per cent. This gradually diminished in the course of treatment. After the first series albumin was 3 per cent and there was considerable pus, both of which gradually diminished. There were many shreds after eventful, the patient on the last day declaring that he had never felt better in his life.

The second cystogram (Fig. 2) shows no appreciable diminution in the size of the tumor, but we are glad to note a complete relief of the alarming symptoms which had persisted for 6 months. Examination of the prostate per rectum shows a marked diminution in size, probably to one-third, and constipation which was a constant symptom for years has been entirely relieved.

The future alone will determine whether this is a cure. The immediate relief obtained prompted me to report this case. The facts enumerated above indicate that deep x-ray therapy is at least a valuable palliative measure and deserves our serious consideration.

Appendix.—At the present time (March 1, more than six months since the first treatment) the patient is well and free of all symptoms.

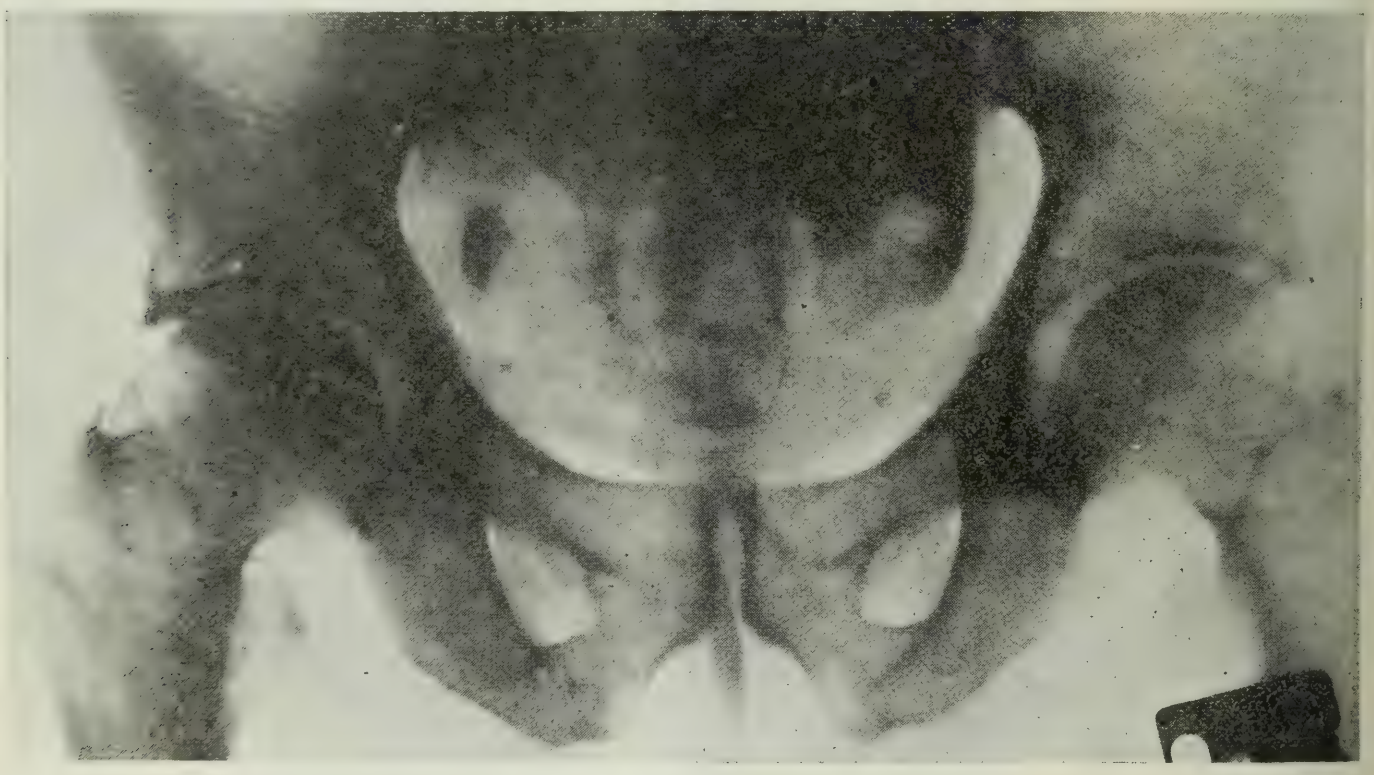

Fig. 2.—Tumor thirty days after first x-ray treatment.

both series. At end of the last treatment there were pure growths of Bacillus coli.

Effect on Bladder Symptoms.—The day following the first application, tenesmus and frequency diminished. Subsequently the pain, tenesmus, and frequency progressively diminished until the last day when the patient felt perfectly comfortable. This condition continued until the second series. There was no blood in the interim.

A cystogram was made before beginning the second series and a 25 per cent solution of bromid was used through a silk woven catheter.

The first treatment was applied shortly after and was followed by a urethral chill. The next day the patient developed a laryngitis (grippal) and further treatment had to be postponed to October 30. The treatment after this was un-

DISCUSSION

Dr. Abraham Nelken, New Orleans, La.—I have had a few recent cases that may be of interest.

The first was a man with carcinoma in the right trigone, where I destroyed the growth down to the mucosa with the high frequency current and then decided to continue treatment with deep x-ray therapy. There being no apparatus in New Orleans at that time, the patient was sent to Chicago for one radiation. I cystoscoped him six weeks after treatment with deep x-ray therapy and found that the growth had not only returned, but was worse than before. Just before

leaving home I found it necessary to open his bladder because of severe hemorrhage.

The second case had been treated by deep x-ray therapy and when the man came into my care he had bled so profusely that his hemoglobin was reduced to less than 50 per cent and the blood count was 2,500,000. Because of the hemorrhage and our inability to pass catheters without trauma, I felt that, in spite of his bad condition, nothing but a suprapubic operation would help him. I opened his bladder and made as hurried an observation of the prostatic region as was possible. I found not the usual broken down ulcerating condition of the prostate which we commonly see, but a hard board-like mass inclosing the internal meatus. The patient stood the immediate effect of the operation fairly well, but passed away like a burnt out candle a few hours afterward.

Dr. Gelpi (closing).—I have heard it said that the deep x-ray destroys organisms. In my case a culture taken after the last treatment showed a pure growth of colon bacillus.

We are told that the way the deep x-ray therapy reaches the cancer is by destroying the cancer cell and promoting fibrosis. In this way the hemorrhage is controlled. No doubt in our case the cancer cells have been destroyed, but whether the cure is complete or not, only time will tell.

I wish to refer to another case in which I advised the use of the deep x-ray. Called in consultation for a man who was bleeding profusely, I cystoscoped him and made a diagnosis of cancer of the trigone and part of the bladder fundus. The patient did not improve, the bleeding persisting. He died shortly after from an embolus, judging from the symptoms described by his physician. We are told—and this has been verified—that when it comes to organs that are thin, such as the stomach, esophagus, or the large and small bowel, the results are not so good. Even though the cancer tissues are destroyed, only a fibrous wall is left. Where there is a solid structure with excrescences, the effect is entirely different.

OVARIAN CYSTS IN CHILDREN: REPORT OF CASES*

By Brodie C. Nalle,
M.A., M.D., F.A.C.S.,
Charlotte, N. C.

I present a report of two cases only of ovarian cysts in children to call your attention to the small number of such reported cases, and to emphasize the importance of early diagnosis and treatment of them.

*Read in Section on Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Weil, in the *Johns Hopkins Bulletin*, in 1905, says that up to 1904 there were reported in the literature only sixty cases of ovarian tumors in children under ten years of age. Of these sixty cases, 66 per cent were reported benign and 34 per cent malignant.

Downes, in the *Journal of the American Medical Association*, in 1921, states that since 1904 there have been reported twenty-six cases under ten years of age. Of these twenty-six cases, 62 per cent were reported malignant and 38 per cent benign. He suggests that the more careful microscopic examinations probably account for the much higher rate of malignancy in the latter series. The high rate of malignancy is sufficient to arouse our interest in the early diagnosis of these cases, since the only hope in this 62 per cent of malignant cases lies in their early detection and removal.

Large ovarian cysts have been reported in the fetus. It is generally agreed that the earlier in life these tumors make their appearance, the better are the chances that the growth is benign. The earliest reported case of malignancy was in a child one year and eight months old. The earliest reported case of dermoid was in a two-year-old child.

Earlier ideas of the origin of epithelial structures in the ovary and of the origin of epithelial tumors of the ovary have been definitely changed in recent years through the most interesting and scientific work of Goodall and others, which will result in the histogenetic classification of ovarian tumors instead of the topical, clinical, or histological classification.

Goodall says:

"A careful study of the mammalian ovary leads at once to the important fact that from a developmental point of view the resemblance between the ovary and the testis is a very striking one. There is nothing in the testicle that has not had at some time in embryonic life its homologue in the ovary. It therefore follows that of the structures that are permanent in the testicle, some are transitory in the ovary and disappear completely, others degenerate but do not disappear, still others remain but are modified to suit a modified function. The female embryo having developed more or less perfect testicles, progresses still further by destruction, modification and addition. It is the development of all the testicular elements and their subsequent incomplete atrophy which has made of the ovary

such a fertile field for the development of epithelial tumors of the most varied types."

Until rather recently, it was generally thought that the germinal epithelium of the ovary penetrated only the outer cortical third of the organ. Now it is generally accepted that all epithelial structures within the ovary are derived from the germinal epithelium, and that by division and differentiation these structures have attained wide differences in form and function, but are still able to manifest the primitive characteristics of germinal epithelium when they are subjected to the proper stimulus.

The old theory held that dermoids and teratomata were mixed tumors arising from fetal rests of already differentiated cells in the ovary transplanted there from other organs. The more recent theory of Goodall is that the ovules by a system of pathogenesis are responsible for the formation of dermoids and teratomata.

Pfannenstiel maintains that the dermoids and teratomata of the trunk and peritoneal cavity have their origin from ectopic ovarian tissue which we know is found throughout the abdominal and pelvic cavities. If we exclude the condition commonly known as "hydrops folliculi," the Graafian follicle is denied the power of cyst formation by Nagel and Goodall, who believe that this condition is nothing more than unusually large, healthy Graafian follicles.

Goodall concludes that the vast majority of human ovaries contain all the necessary epithelial rests or late invasions for the development of cysts and tumors; that these rests or invasions, being derived from the germinal epithelium, possess the wonderful metaplastic properties of this epithelium; that the germinal epithelium can transform itself into mucous cells, which have all the characteristics of the lining cells of the pseudo-mucinous cyst, and so he is convinced that these pseudo-mucinous cysts have their origin from the germinal epithelium.

Inflammation of the pelvic peritoneum giving rise to a chronic peri-oophoritis frequently acts as a stimulus to the many fetal remnants in the ovary and results in cyst formation.

DIAGNOSIS

It is probable from the small number of reported cases of ovarian cysts in children under ten years of age that this condition has been frequently overlooked or not reported.

Possibly some of the undiagnosed acute abdomens in young children, which were not operated upon and upon which no autopsy was done, have been ovarian cysts with torsion of the pedicle or other complications. Many of the reported cases of cysts were not suspected before operation.

Diagnosis of this condition in children offers a great many difficulties. The occurrence is unusual and therefore is not often considered among the possibilities. Again frequently, especially in benign cases, the general health of the child is not impaired, and therefore the enlarging abdomen does not attract due consideration of the parents or physician. On the other hand, the history of a previously healthy child beginning to show constitutional symptoms with abdominal enlargement should attract attention, and this condition should suggest malignancy. The uterus and appendages in the very young are abdominal rather than pelvic organs, so that frequently an ovarian cyst with a pedicle situated high in the abdomen is difficult to differentiate from other abdominal conditions. Rectal examination will frequently be of aid in detecting the pedicle. X-ray examination after a barium meal or enema is useful in showing the relation of the growth to the intestinal canal.

Precocious development of the generative organs should always at least suggest ovarian tumor. Ususually the first symptom noticed is the gradually enlarging abdomen, frequently without pain or discomfort and without constitutional symptoms. Occasionally acute abdominal pain, due to torsion of the pedicle, is the first symptom noticed.

Surgery is the only treatment. In operating, effort should be made to remove the tumor without aspiration or rupture, since the probability of malignancy is always present and this procedure, if successful, will prevent the dissemination of

the malignant contents over the peritoneal cavity.

Dr. Howard Kelly, in his report of ovarian tumors of children in Keating's "Encyclopedia," states that 50 per cent of children operated upon under three years of age for ovarian cyst died.

Earlier diagnosis and operation can certainly reduce this mortality, and when we treat the acute abdomens and surgical conditions of children with the same care and precautions as to the time of operation, the use of purgatives, etc., that we do adults, the fallacy that children stand operations badly will be proven. We shall find that they are, with an equal chance, very fine surgical risks.

CASE REPORTS

Case I.—In a child of nine years a general abdominal enlargement had been noticed, gradually increasing over a period of several years. No particular attention was paid by the parents of the child nor by the physician until she began to show marked constitutional symptoms, abdominal pains and dyspnea. Upon admittance to the hospital September 15, 1909, examination showed a poorly nourished, anemic, rather emaciated child, with an extremely distended abdomen. Heart, lungs and kidneys were negative. From abdominal examination, a probable diagnosis of ovarian cyst was made. Operation revealed a pedunculated cyst arising from the right ovary, which was removed intact. The sack contained approximately 3500 c. c. of a straw-colored cystic fluid. The left ovary and tube were normal. After a fairly stormy convalescence the child made a good recovery. She is now in good health and the mother of two children.

Case II.—In a child of twenty months, normal and healthy since birth, the mother had noticed the abdomen enlarging for six months. The general health and development of the child was so good that no anxiety was felt. Two physicians saw and examined her during the period, but not until later did they feel justified in advising operation for probable cyst. The child was admitted to the hospital March 15, 1919. Examination showed an extremely well nourished, healthy, fat, happy child. The abdomen was greatly enlarged. There was dullness generally over the abdomen. The heart and lungs were normal. Blood and urine were normal. Temperature, pulse and respiration were normal. The operation was on March 16, 1919. A median incision revealed a large, post-peritoneal cyst, arising from the region of the broad ligament on the left side, not pedunculated. The cyst was approached through an incision in the posterior layer of the peritoneum. The sack was thin and intimately adhered to the adjoining structures. During the process of separation it was ruptured and its contents were spread into the abdominal cavity. It was finally with difficulty enucleated. The contents, which consisted of a straw-colored fluid, were estimated at about 2500 c. c. The sack was not examined microscopically. The child made an unusually rapid recovery; was removed from the hospital on the eighth day, and today, after three and a half years, is a beautiful specimen of health.

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DISCUSSION

Dr. Lucius E. Burch, Nashville, Tenn.—Ovarian cysts are quite rare in childhood, and for this reason none of us has had a large experience with them.

Cysts are divided into a number of important varieties. We have first the retention cyst, which includes of course the follicular cyst and the cyst of the corpus luteum. This form of cyst is rarely, if ever, seen in childhood. The two great varieties of ovarian cyst are the proliferating and the non-proliferating. The most common of all ovarian cysts is the proliferating cyst and the most common variety of the proliferating cyst is the cyst adenoma pseudo-mucinosum, which is often spoken of as the glandular cyst. It is a cyst of unlimited size, occurs at all ages, and is occasionally seen in childhood. The most dangerous cyst of the ovary is the cyst adenoma serosum or the papillary cyst. This variety is characterized by the presence of warts in the interior, has a great tendency toward malignancy and is frequently bilateral. It frequently ruptures, and when this occurs there is a possibility of metastasis over the peritoneal cavity.

The most common cyst in childhood is the dermoid cyst, and this variety is sometimes associated with the glandular. A dermoid cyst may be bilateral, but it is not as often bilateral

as the papillomatous. Ovarian cysts in childhood are difficult of diagnosis for the reason that they present no symptoms until complications come up or until the cyst is of sufficient size to be noticed by the patient or to produce pressure symptoms.

The teratoma is a very rare condition. My recollection is that only about seventy cases have been reported in literature. The Doctor has brought out the point that rectal examination is of great assistance in the diagnosis of these cases in childhood. I should like to suggest that the examination, both rectal and abdominal, be made under an anesthetic. It is wise to bring conditions of this kind before the Section, for the reason that they are unusual. We should know that they exist and be on the lookout for them.

Dr. Arthur W. Ralls, Gadsden, Ala.—I wish to report a case which is related to this paper. A girl fifteen years old had never menstruated and entered the hospital with a large tumor filling the abdomen. The tumor dated from an attack of mumps one year previously. I have never seen a case of this type reported. She had suffered for about a month following an attack of parotitis and felt an abdominal mass two months after this illness. The case went on for about a year, when it was operated upon and a cyst found which contained a large amount of fluid. It was of the simple glandular variety and was easily tied off. The recovery was uneventful.

In this case it is significant that the female generative organ was affected as it sometimes is in the male following mumps.

Dr. Wm. T. Black, Memphis, Tenn.—Proliferating types of cysts are rarely observed. The Graafian follicle does not mature and rupture does not take place (which forms the corpus luteum) until puberty, consequently corpus luteum cysts are not present before menstruation takes place. It is estimated that from 5 to 10 per cent of ovarian cysts are of the dermoid type. Thus we have in the child this type of tumor more often than one would usually suppose. As the latter type of tumor grows slowly we are seldom called upon to operate in a very young child, even when dermoid cysts are present. The teratoma is a type of rare tumor which is occasionally observed. I operated upon a child of eleven years of age about a year ago who had a teratoma larger than an adult's head. There have probably not been over 50 cases of this type reported, including those occurring in the adult as well as in the child.

Dr. T. S. Field, Jacksonville, Fla.—I have had three cases of ovarian cyst in children: two of them twisted pedicle cysts and one a teratoma. The diagnosis is said to be very difficult, but I do not think it should be so. There are only a few things that a tumor in a child can be. The diagnosis is made difficult by the fact that in many children the enlargement of the abdomen is not noticed unless the people are very intelligent. When the pedicle becomes twisted the child has an acute abdomen and the doctor finds an enlargement, the child has temperature, both of mine had 102° F., and there is also a leucocytosis. (One of mine had 12,500 and the other 16,000.) The acute abdomen is due to the fact that the circulation of the cyst is cut off. There is a good deal of free fluid and the cyst or tube is often gangrenous, accounting for the leucocytosis. In these cases there is also very frequently a severe congestion of the bladder, with blood in the urine. In the last case I had Dr. McIver check up this condition by cystoscope on account of the fact that a paper was published reporting twenty-three cases in the literature, all suggesting blood in the urine. In this case we found the vessels much dilated. The diagnosis in a generally enlarged abdomen and a suddenly acute abdomen should be easy if we keep the condition in mind. I know of four cases in Jacksonville that might be added to the literature, and doubtless there are many in other cities. Many cases have not been reported. They are not as rare as is thought.

Childs, in his monograph on sterility, reports a condition which we might think of in connection with ovarian cyst in children. My three cases were all in children at about the age of puberty. Childs has reported a thickened coat over the ovary upon removing which the patient became pregnant. The first Graafian follicle might easily turn into a cyst, due to the inability of this follicle to rupture by reason of a congenitally thickened germinal epithelium of Waldeyer. This is an unproven theory, of course, but ovarian cysts are something we know very little about.

Dr. Robert B. McIver, Jacksonville, Fla.—It has been our custom to study carefully the urinary tract in all cases of suspected ovarian cyst, to rule out hydro-nephrosis in the kidney of the corresponding side. In the case Dr. Field has just cited there was an acute abdomen with a right-sided mass and hematuria. Cystoscopy revealed nothing except congestion of the vesical mucosa around the right ureteral orifice. The examination for right hydro-nephrosis was negative.

As Dr. Burch has mentioned, these cases may be confused with acute appendicitis. I shall briefly mention the case of a young white female who was admitted to the hospital complaining of abdominal pain. The history pointed to acute appendicitis. Fever and leucocytosis (18,000) were present, there was a mass beneath McBurney's point, the right lower abdomen was tender and rigid, and the urinary tract was negative. On pelvic examination the right tube and ovary were identified as separate from the right-sided tender abdominal mass. A diagnosis of appendiceal abscess was made and confirmed by consultation. At operation the mass was proved to be a twisted pedicle left ovarian cyst (dermoid), strangulated and adherent to the abdominal wall below the lower right rectus muscle.

Dr. C. N. Cowden, Nashville, Tenn.—Each of the discussants has referred to this cyst as being similar to the pseudo-mucinous cyst. My impression is that they all come from the ovary.

If they do, I am the only surgeon who has ever removed one of them from a male abdomen. A few days ago I removed a tumor that came back from the pathologist with that tag attached. The tumor was attached behind the peritoneum and was a peculiar growth the size of a large lemon. It had one mother cyst and a number of smaller ones just as you find with a multilocular cyst. I thought it was a dermoid and used a great deal of care in getting it out. If these gentlemen are right that these things come only from the ovary I am in a class by myself.

Dr. Nalle (closing).—No doubt many of us have seen these cases and not reported them.

The differential diagnosis between tumors of the kidney, mesenteric cysts and other abdominal conditions is difficult. This is borne out by the fact that most of the reported cases in literature were not diagnosed nor suspected until after exploration of the abdominal cavity.

Dr. Cowden spoke of the formation of cysts from the testicle. As I mentioned in my paper, Dr. Goodall states that these cysts are derived from the germinal epithelium. Changes in the ovary, which are mentioned in my paper, render the ovary a more fertile field for development of cysts, but these cysts can occur in the male tissue and the male is also entitled to a little ovarian cyst.

PRE-PARTUM CARE WITH SPECIAL REFERENCE TO THE VALUE OF AN EARLY DIAGNOSIS AND TREATMENT OF CERTAIN COMPLICATIONS*

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and
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The United States has the distinction of having the highest maternal mortality of seventeen civilized countries. Last year twenty thousand women died from childbirth. An average of only one in seventeen received suitable medical attention. Much has been written upon pre-natal care, and the plea for better obstetrics has often been brought to the attention of the profession, but on account of this high mortality too much emphasis cannot be laid upon this subject. During the past few years statistics from well organized obstetrical clinics have proven that proper pre-natal care will lower maternal mortality.

One great difficulty we have to overcome is the ignorance of the average woman concerning the value of scientific pre-partum care. So many expectant mothers delay reporting to the physician until the latter months of pregnancy or until some complication arises. The subject of cancer has justly received much publicity. Similar organized publicity concerning pre-natal care is essential before we can hope to approach the ideal in the proper care of the expectant mother.

The following is our routine in handling maternity cases: on the first visit a careful history is taken and a complete physical examination made and recorded. The urine is examined in all cases, and a Wassermann made if a history of repeated miscarriages is given or a general adenopathy is present. The vaginal examination and taking of pelvic measurements are usually delayed until about the seventh month. The patient is assured that pregnancy is a physiological process. In giving advice to a pregnant woman it is always wise to consider her ignorant of the proper mode of life in this condition and give her minute directions with a written outline as follows:

(1) Dress comfortably. Avoid circular constriction at any part of the body.

(2) First three months, corset may be worn loosely laced. Then discard it for maternity corset. May also use a bust supporter. Avoid violent motions, golf, tennis, swimming or automobile rides.

(3) Take tepid baths; in last two weeks no tub baths; use shower and sponging. Take no douche unless ordered, and especially in the last month. Allow nothing to touch the external genitalia.

(4) The bowels must move every day.

(5) Keep the breasts free from pressure, bathe the nipples once a week with tincture of green soap and anoint them daily with sterilized alboline. After the seventh month bathe them night and morning with a solution of equal parts of alcohol and water to which add a teaspoonful of borax.

(6) Send a four-ounce specimen of the morning urine for examination every month for the first five months; every two weeks for the next three months, and then every week. Also, report to my office. Measure the quantity of urine secreted in twenty-four hours every two weeks during the last four months.

(7) Use an alkaline mouth wash or milk of magnesia on retiring and consult your dentist,

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if indicated, and advise him as to your condition.

We cannot lay too much stress upon a complete examination of the urine and blood pressure reading every month for the first five months, every two weeks for the next three months, and then every week for the last month. If abnormalities are found, these examinations are made more frequently. This is sufficient in the majority of cases to make a tentative diagnosis of toxemia of pregnancy.

TOXEMIA OF PREGNANCY

The mortality of toxemia of pregnancy is sufficient to justify every effort to make an early diagnosis of the condition. During the past four years the records of the Charity Hospital, New Orleans, show 38 deaths from eclampsia out of 2792 obstetrical cases. The Child Welfare Association of New Orleans handled 619 cases with 2 deaths (was unable to obtain cooperation from these two patients). The outdoor obstetrical department of Touro Infirmary show 1 death out of 580 cases. We believe proper pre-natal care is responsible for the relatively low mortality of the Child Welfare Association and Touro Infirmary. The majority of eclamptics entering Charity Hospital have never received pre-natal care and often were in a dying condition on admission. The obstetrician in private practice obtains better cooperation from more intelligent patients. Therefore, his mortality should be low. The instigation of prophylaxis leads to a low mortality. These symptoms usually develop after the sixth month and are characterized by headache, malaise, visual disturbances before the eyes, more or less edema of the extremities and moderate high blood pressure. The urine shows a low specific gravity, with or without albumin, and often indican, acetone and diacetic acid.

Another aid in making a diagnosis is the ophthalmoscope, as a beginning nephritis is recognized by a retinitis long before albumin and casts appear in the urine. A chemical examination of the blood will show an increase in the retention of nitrogenous products, particularly uric acid and creatinin. Prophylaxis consists of a diet rich in carbohydrates and the maintenance of elimination throughout pregnancy. The diet list which we give our patients is as follows:

DIET LIST

During the first four months the diet may consist of the usual articles of food, avoiding an excessive quantity of meat and using vegetable fats instead of animal whenever possible. After the fourth month the patient may take the following not oftener than once a day:

One or two eggs, fish in any style, roast lamb, tender roast beef, bacon, home game, breast of chicken or turkey.

Soups.—All clear soups, vegetable broths, puree of corn, beans, peas, asparagus, tomatoes, celery, spinach.

Farinaceous.—Oatmeal, rice, hominy, grits, tapioca, cracked wheat, grape nuts, corn flakes, puffed rice, whole wheat bread or biscuits, corn, rye and graham bread, muffins, waffles, rolls, crackers, dry and buttered toast, batter cakes, noodles, macaroni, spaghetti.

Vegetables.—Potatoes (sweet and Irish), green peas, string beans, butter beans, egg plants, carrots, beets, artichokes, spinach, celery, lettuce, alligator pears. All vegetables except onions, cabbage, cauliflower and turnips.

Desserts.—Rice and sago with cream and sugar, stewed fruits, jellies, jams, preserves and marmalades, nuts and syrup, gelatin, baked apple dumplings, apple and rhubarb pies, prunes, pears and apples either raw or cooked, jellies and jams.

Liquids.—Weak tea and coffee (with cream or milk), buttermilk, grape juice, orangeade, limeade, Vichy. An abundance of pure water, cold or hot (ten glasses each day).

The treatment of pre-eclampsia is rest in bed, a carbohydrate diet, fluids freely, alkalies and purgation. If the blood pressure is persistently above 175 after this treatment we resort to venesection, intravenous glucose and immediately induce labor, with as little shock as possible.

PERNICIOUS VOMITING

Pernicious vomiting is a type of toxemia that we should not overlook. The French report a mortality of 30 per cent. However, the mortality varies in different clinics. An early differential diagnosis from the reflex and neurotic types of vomiting is essential, but very difficult. Every persistent case of vomiting should be considered pernicious until proven otherwise, especially the case which shows signs of toxemia and a yellow stain of skin and sclera. Chemical examination of the blood will show an increase in uric acid in pernicious vomiting, which will differentiate it

from the neurotic or reflex type. The urine shows a high ammonia coefficient in vomiting of the toxic type. This was first demonstrated by Williams. After establishing a diagnosis, isolate the patient preferably in a hospital. Nourish her frequently, if nourishment is tolerated, and instigate proctoclysis, using 8 per cent glucose and 2½ per cent sodium bicarbonate. In severe cases the duodenal tube has the greatest field of any form of treatment when intelligently and judiciously used. We have used it in two cases. It was difficult to pass the tube, at first, but it was passed with a fair degree of ease after giving morphia grain one-fourth hypodermatically 45 minutes beforehand, and spraying the naso-pharynx and pharynx with a 2 per cent cocain hydrochlorid solution. We pulled the tongue well forward and swabbed the base with a 5 per cent cocain hydrochlorid solution ten minutes before inserting the tube. We left the tube in place for five days, giving a continuous drip of 8 per cent glucose and 2½ per cent sodium bicarbonate, alternating with a modification of Bacon's formula or peptonized milk. Sodium bromid was given through the tube as indicated.

DIABETES

True diabetes complicating pregnancy is rare. Williams collected 66 cases with a mortality of 50 per cent. One half of these died at or within two weeks of the time of labor and the other half within two years. Every woman with true diabetes should be advised not to become pregnant. If a diagnosis of diabetes is made after conception, pregnancy should be terminated.

ORGANIC HEART CONDITIONS

Heart conditions of pregnancy are both medical and obstetrical. Murmurs are often observed, but many are functional and if improperly interpreted may lead to undue anxiety on the part of the obstetrician and unwise advice to the patient. The gravity of organic lesions cannot be overestimated, particularly of mitral stenosis and aortic regurgitation. A history of rheumatism, especially associated with a focus of infection and the physical findings characterizing organic heart trouble, is of diagnostic value, but a diagnosis does not make a prognosis. The propelling force of the heart, the cardiac reserve, is the factor which determines whether a continuation of pregnancy should be allowed. A low cardiac reserve is indicated by exhaustion after slight exercise, a rapid heart, and a low pulse pressure. Labor should be induced if a patient shows a low cardiac reserve and signs of broken compensation when at complete rest. The condition of the individual case determines the method of delivery. Cesarean section is the preferable method of delivery in the majority of cases, and at the same time the patient should be sterilized. This should be done under local anesthesia with the assistance of a light general anesthetic to avoid all possible shock. Women with an organic heart lesion should not become pregnant. It has been estimated that every pregnancy shortens the life of the mother five years.

TUBERCULOSIS

The scourge of tuberculosis is well known and very often the doctor is confronted with the problem of tuberculosis complicated with pregnancy. Out of 619 women examined by the Child Welfare Association, 12 had tuberculosis, and 13 out of 580 examined by the outdoor obstetrical department of Touro infirmary. It has been stated that 11,000 to 12,000 tuberculous pregnant women die annually in the United States. Lebirt found that pregnancy had a bad influence on the course of tuberculosis in 75 per cent of the cases. These figures demonstrate the necessity of a careful history and physical examination. We should not lose an opportunity to impress every tuberculous woman with the dangers of pregnancy. When confronted with this problem, terminate pregnancy at once in all cases of acute or sub-acute tuberculosis. If the lung condition has been quiescent from three to five years, advise the patient along hygienic and dietary lines, making frequent examinations. If signs of activity develop early, induce labor at once, but in the latter months the question of temporizing must be considered. About the same principles apply in delivering a tuberculous woman as in organic heart conditions.

Cesarean section under a local anesthetic is preferable to the stress and strain of abnormal delivery in the majority of cases, as the exhaustion and loss of blood may lead to an exacerbation.

ABORTIONS

Dr. Cragin reports that out of 1000 consecutive patients in private practice 371 had one or more miscarriages. From our experience this is a conservative estimate. The causes of abortions are numerous. Syphilis is the most important from the standpoint of pre-natal care. A Wassermann should be made in all suspected cases. A patient showing a negative Wassermann with the history of frequent abortions should be given antiluetic treatment unless the abortions can be otherwise explained.

During the first three months of pregnancy vaginal examination, especially palpation of the ovaries, should be avoided when possible, as this often leads to a miscarriage.

PELVIC MEASUREMENTS

How many physicians doing obstetrics take pelvic measurements routinely? So often the life of the mother, as well as the baby, is sacrificed from neglect of this important matter. Consider the morbidity and mortality following instrumental delivery through a deformed or contracted pelvis. Cesarean section or early induction of labor as indicated by pelvic measurements will certainly lessen this mortality and morbidity.

FEBRILE CONDITIONS

Acute febrile conditions are too numerous to mention. Warn the pregnant woman against exposure to infectious and contagious diseases. Suspect pyelitis and in the South, malaria, in all cases of inexplicable fever complicating pregnancy. Pus and bacteria found in a catheterized specimen of urine will indicate pyelitis. A cystoscopic examination is necessary if pus and bacteria persist in the urine after urinary antiseptics, abundant water, rest in bed and irrigation of the bladder. It is essential to make a thorough examination of the blood for plasmodia if malaria is suspected and that a diagnosis be made prior to administering quinin. If quinin is indicated, put the patient to bed and give codein and bromid while administering it.

CONCLUSIONS

(1) Maternal mortality is a national problem. Education of the public and an awakening of the profession concerning scientific pre-natal care will do much to solve this most important problem.

(2) The need in obstetrics today is not new ideas so much as the practical application of the old; such as a careful history, physical examination, pelvic measurements and routine urine analysis.

(3) The mortality of toxemia of pregnancy can be lowered by prophylaxis and its early recognition. Do not temporize too long, but induce labor if there is no response to treatment in 36 to 72 hours.

(4) Every pregnant woman with an organic lesion of the heart or pulmonary tuberculosis should be under the direct care of a competent internist, if available.

(5) Young married women with organic cardiac lesions, such as mitral stenosis and aorta regurgitation, or pulmonary tuberculosis, should be sterilized with their consent.

(6) Pelvic measurements are important. This will lower the maternal and fetal mortality and lesson morbidity.

(7) Scientific pre-natal care will not only lower the maternal mortality and morbidity, but also the fetal mortality.

We wish to thank Dr. J. W. Newman, of Touro Infirmary, Charity Hospital, and the Child Welfare Association for the use of their records.

DISCUSSION

Dr. J. C. Brooks, Chattanooga, Tenn.—Most obstetricians make a mistake in not taking time to advise and counsel expectant mothers. It is not an infrequent occurrence to be called in to deliver another man's case for him. In taking down the history one often finds that the physician who expected to take care of the case has never examined the urine, has never made a pelvic examination, knows nothing about the pelvic measurements; in fact, was expecting to come when the patient or some one of the family informed him that she was in labor. That kind of obstetrics ought to be done away with. I do not believe the general practitioner should wait upon a case unless he feels he has time to devote to it.

In Chattanooga we have a City Hospital with an obstetrical department that is capable of taking care of all cases that come in for charity service, but it is not used as it should be. It is because our people are not educated to the advantages to them of hospital care. It is true that a good many patients cannot go. Their families are so situated that they cannot leave home. Sometimes they do not want to go as charity patients, and yet they cannot afford the expense of a private hospital. We should wait on the other man's wife as we would want our wife to be waited on.

Dr. Walter E. Levy, New Orleans, La.—When Dr. Sellers came to Touro Infirmary and asked for statistics of our department we willingly gave them, because we are proud of them. I should like to elaborate somewhat on his paper.

The patient reports to us and a complete clinical history is taken, not alone an obstetrical history, but a clinical history. The patient is sent for a routine Wassermann, and until recently we sent them for routine heart and lung examination by an internist. Unfortunately, we have to do that now ourselves because the patients are so numerous. We separate the negroes and the whites. We tell both just what we expect of them. As soon as we can we shall institute prenatal lectures to the mothers. We expect also to lend out samples of clothing that we think the mother should wear, and we shall put up sample layettes. Dr. DeBuys, who is chief of our pediatrics division, will give lectures on the care of the newborn. We are starting a campaign to educate these women.

On one or two points I do not agree with Dr. Sellers. One is the difficulty in passing a tube in treating the vomiting of pregnancy. We have never had that difficulty, as we pass a nasal tube.

As to interfering when the blood pressure persistently stays above 175, I think Dr. Sellers is too radical. If we do not lower it below 175 we watch the patient more carefully and see that every other day, if possible, the blood pressure is taken and the urine examined, but we do not interfere. I think we are doing too much meddlesome work. We interfere entirely too much and create abnormalities that do not exist. If we get a toxic case we do the 'phthalein test, we study the eye grounds and estimate the diastatic ferment in the urine, whether it is a case of eclampsia or a typical renal case. In the diabetes of pregnancy, of course sugar in the urine is nothing uncommon. But what we try to do is a determination test to see whether we have a true glycosuria or galactosuria or a lowered renal threshold. In true diabetes there are three dangers: hemorrhage, infection and sudden going into coma of these patients.

Dr. George F. Wilson, Charleston, S. C.—By accident I found that the intravenous injection of sodium bicarbonate acts like a miracle in hyperemesis. I found the benefit of this in a desperately ill patient and seeing the wonderful improvement following the injection of 350 c. c. of 3 per cent sodium bicarbonate solution, I have continued that treatment. I have seen women come into the hospital in convulsion with a blood pressure of 128 mm., 136 mm., 145 mm., 160 mm., 165 mm., so I cannot feel safe in waiting for 175 mm. as the other gentlemen are. I have not lost a private patient from eclampsia in ten years, so I propose to continue induction, combined with the Hastings treatment. However, in hospital work it is a different proposition altogether. Those who use the morphin method alone I do not think should be surprised at the fetal mortality. I understand McPherson's fetal mortality is larger than I think his paper would make us believe.

I wonder how many have to deal with pregnant women and hookworm? The treatment is simple. Hookworm patients develop a decided toxemia which resembles the toxemia of pregnancy. Some of them have swelling of the legs, albumin in the urine, hyalin and other casts, and they have every appearance of a woman in a far advanced stage of the toxemia of pregnancy. However, they have a marked eosinophilia, and we find their blood pressure is very low.

Not enough attention is paid to post-partum care.

Dr. Wm. T. McConnell, Louisville, Ky.—Before I went into private practice I did chest work in an institution for two years, where I saw how the pregnant tuberculous women and their babies got along. If these women had proper attention while they were carrying the children, and if they received proper tuberculosis treatment afterward, it would save many of them from therapeutic abortion. In my private work I have never found it necessary to produce therapeutic abortion in tuberculosis. Every woman I have carried through who has had tuberculosis has been better after pregnancy than before. Of course I will not take these cases unless they agree to do as I tell them and to observe the rules and regulations I lay down for them. It is quite a shock to a woman to pass through therapeutic abortion. Before this is tried two or three things ought to be done. We ought to determine definitely whether tuberculosis is active or subacute, and whether it is arrested and what stage the woman is in. If she is in a far advanced stage of tuberculosis I question whether therapeutic abortion would not be as hard as to have the baby, and if she is given proper care the baby will come through all right.

Dr. George C. Mosher, Kansas City, Mo.—In comparing America's position in obstetrics with the rest of the civilized world, we must recall that not all obstetrical cases are in the hands of physicians. A great many cases are delivered by midwives. Some cities have a midwife practice up to 60 and 80 per cent.

I think with Dr. Adam Wright, of Toronto, that we can cure tuberculosis in the pregnant woman as well as in the non-pregnant, and that our duty to these women is to save the life not only of the mother but of the unborn child. In arrested cases in which there is no fever, no sweat, no cough, and no loss of weight, the

chances of the woman to come through are better if she be left alone. In a case of laryngeal tuberculosis, or in an acute tuberculous condition, of course the question is entirely changed, and that woman should, under advice and proper consultation, be given the chance of an abortion.

Dr. J. George Dempsey, New Orleans, La.—Dr. Sellers has opened up an avenue of thought that should be discussed at every medical meeting, in every county and parish medical society, prenatal care.

It is true that in New Orleans, Touro Infirmary is doing remarkable work in its small way, but when you think of the 37,000 births a year in the State of Louisiana, you can see that the problem is beyond imagination. The same problem exists in every state in the South.

Dr. Newman, of Touro Infirmary, was the originator of teaching women midwifery. He has ceased, and this has been taken up by the Loyola School of Medicine, which is succeeding splendidly. We must do something to educate the midwife throughout the South. We must get her confidence and let her see that we are not trying to deprive her of a livelihood.

Dr. W. G. Bogart, Chattanooga, Tenn.—We shall never get improvement in obstetrical statistics until there is concerted action on the part of those who are doing the work. There must be a unity of action to bring about better conditions for treating those who are pregnant. We are up against the proposition that women have borne children from time immemorial and are not willing to come under our rule. But if we educate our people to the advantage of being particular for their own and their offsprings' sake, we shall begin to see results. It is important to improve this field of work as other fields of medicine have been improved. The greatest need of effort now is in the obstetrical field.

There is a wide difference of opinion as to the handling of tuberculous pregnancies. I have seen tuberculous cases that have done splendidly. The children have been apparently all right and have grown to manhood and womanhood. It seems to me that abortion is about as dangerous as to allow them to go to full term.

Dr. George F. Pendleton, Kansas City, Mo.—Therapeutic abortion may be necessary, but it is on the boundary line between what is ethical and what is not ethical, on the boundary of what is moral and what is not moral. Let us get away from therapeutic abortion cases, if possible, in defense of the honor of organized medicine.

Dr. Sellers (closing).—Dr. Levy questioned the advisability of inducing labor with a persistent blood pressure of 175. Of course, some women run a blood pressure of 175 under normal conditions, but a blood pressure rising to 175 with other pre-eclamptic symptoms justifies interference.

I thank Dr. Wilson for his suggestion of the use of sodium bicarbonate intravenously for the vomiting of pregnancy.

A woman with active pulmonary tuberculosis should not be subjected to the stress of pregnancy for five or six months.

LOW BACK PAIN*

By R. Wallace Billington, M.D.,
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Though this subject has been frequently discussed, there is much confusion of opinion as to its cause. American orthopedic surgeons are slowly but surely leading the way to a rational understanding of it.

The cause is difficult to diagnose and many physicians are still satisfied to call it a sacro-iliac strain, which sounds more scientific and up-to-date than the older terms, lumbago, sciatica, and rheumatism, though often it is no more correct.

I saw a large number of patients with this complaint in military service as consultant to the U.S.P.H.S. and Veterans' Bureau, and also in private practice. It is not always easy to know whether there is any real trouble at all, especially in military service or where there is a question of compensation for alleged injury or disease.

The orthopedic surgeon is often called as an expert in such cases and we cannot be too careful in our examination or in our expressed opinion, in justice to both the patient and the one from whom compensation is sought. I have come to the conclusion that if one does not find consistently guarded movements, definitely limited motion of lumbar spine or persistent and consistent faulty attitude or deformity there can be little, if any, disability due to alleged injury or disease of the spine or sacro-iliacs. One or more of these signs may be assumed or exaggerated by the voluntary effort of the patient, but one who is well trained in making such observations will rarely be deceived. If one or more of the signs is present, a thorough effort to determine the exact trouble must, of course, be made. None of these signs may be definite in the faulty posture cases, where the backache is of mild chronic type, always brought on by prolonged standing,

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

stooping or exercise and relieved by rest.

The term "sacro-iliac strain" has become a scientific catchword with laymen, lawyers, and many of the medical profession for explaining all sorts of low back pains, with or without sciatic symptoms. It is causing much confusion and many unjust verdicts in the courts. A recent case is illustrative:

A man, age 60, who had had pains in his lower back and "sciatica" at times for two or three years, received a slight jar on an elevator. He was not thrown down and made no complaint until a few days after the alleged injury, and then he was no worse than before injury. He was examined by physicians who diagnosed sacro-iliac strain, also an osteopath and chiropractor, who, of course, said "subluxation of the vertebra." When I examined him several months later he was still complaining of low back and bilateral thigh pains. There was definitely localized tenderness over the third and fourth lumbar vertebrae, but none over the sacro-iliac joints. There was also definitely limited spinal motion, extreme movements causing pain in the mid-lumbar region. An x-ray showed lipping of the third and fourth lumbar vertebrae, and I was convinced that this man had a chronic osteo-arthritis of the spine, which is certainly a more rational explanation of all his trouble than is sacro-iliac injury.

The causes for low back and leg pains may be classed under five groups: (1) trauma, including strains, sprains, fractures, dislocations, etc.; (2) faulty posture with relaxed ligaments and muscles; (3) diseases of the spine and sacro-iliac joints; (4) intra-abdominal and pelvic pathology; (5) skeletal malformations, defects, and deformities.

While it cannot be denied that traumatic lesions of the sacro-iliac joints do occur, a careful consideration of the anatomy and mechanics of motion and body strains shows a much greater liability to bone, joint, and ligament injury in the lumbar spine than in the sacro-iliac joints. The lumbar joints are much more movable and less securely supported, and, with the powerful leverage that takes place in extreme movements or sudden twists unguarded by the trunk muscles, they are very liable to strain or rupture of the inter vertebra or ilio-lumbar ligaments or even fracture of the small articular processes. We know that compression fractures of vertebral bodies are common from the eleventh dorsal to the fifth lumbar, the result of this leverage. Genuine dislocation or fracture at the sacro-iliac joints is comparatively rare, and the same may be said of the dorsal vertebrae above the eleventh, where the spine is braced and supported by the chest wall in a way not unlike that in which the pelvic bones support the sacro-iliac joints. Again, in the unsupported cervical spine we find injuries frequent. In fact, there is a close analogy between many types of low back pains and acute wry-neck, shoulder and arm pains, often spoken of as myalgia, neuralgia, brachial neuritis, etc. Nerve irritation resulting from direct trauma or infectious spondylitis, malformations such as cervical rib or sacralized fifth lumbar, and other factors, are no doubt common causes of pain in these two regions of the spine and along the courses of nerves having their origins there.

Probably the most frequent traumatic cause of back pain is a sprain of the lumbo-sacral or lower lumbar joints. The greatest point of tenderness to deep pressure is, in my experience, most often at the lumbo-sacral junction in mid-line or over the transverse processes of the fifth lumbar. This latter location is no doubt frequently mistaken for the position of the sacro-iliac joint and so taken to indicate strains of the sacro-iliac. In acute low back pain there is usually spasm of lumbar muscles, not of the gluteus maximus or other muscles which may have to do with supporting the sacro-iliac joints. Pain is elicited by lumbar movement rather than by sacro-iliac movement. The referred nerve pains, often bilateral, are more rationally explained by lumbar injury or disease, as are also the characteristic spinal curves and attitudes so often seen. These are referred to in more detail later on. Where there are definite sensory or motor nerve changes in the traumatic cases, the most common localization is in the distribution of the fourth and fifth lumbar segments.

Postural defects, such as flat feet, limbs of unequal length, bow legs, knock knees, genu recurvatum, lordosis, scoliosis, round back, etc., often with relaxed ligaments and lack of normal muscle tone, constitute a considerable group of cases. The mild chronic course, always following standing,

stooping, or overexertion, and relieved by lying down, is usually easily recognized if looked for. The pain is analogous to that of flat foot or foot strain. Obviously such patients are more liable to traumatic back lesions than are normal persons.

The third group (diseases) will usually show bone and joint changes in a careful x-ray examination if the trouble is of long duration. But it should be remembered that tuberculosis, infectious osteo-arthritis and other chronic types may cause symptoms for months or years before definite changes are demonstrable in a radiogram. There are quite a few cases of low grade infections involving a single intervertebral joint, e. g., I have seen this in a half dozen cases following acute meningitis. In one of these there was thinning of the disc and roughening of adjacent surfaces of the third and fourth lumbar vertebrae and such marked and persistent disability that I did an Albee ankylosing operation, with good result. Whether the spinal puncture needle injured the posterior part of the disc, causing a traumatic arthritis or introduced a low grade infection from the skin or whether the meningococcus itself did the damage, I am unable to say, but in all these there were definite x-ray changes and the symptoms began with the attack of meningitis. These were all young ex-service men.

In the different osteo-arthritic types, I have observed that infected teeth seemed the most probable cause in the majority of cases, especially those cases chronic from the beginning; whereas, those which began with definite onset of acute arthritis are more apt to be of tonsillar origin. While it is obviously impossible to prove the truth of this impression, I have come to believe that it is a good working basis in hunting for the source of the infection. Of course, other foci may be responsible.

I have seen many cases with persistent remittent or even intermittent low back pain proven to be cases of local or diffuse osteo-arthritis of the spine after they had passed for many months or years for cases of chronic sacro-iliac strain, lumbago, sciatica, etc. These chronic cases with repeated exacerbations and a persistent limitation of motion of the lumbar and often other regions, with frequently a straightening out of the anterior lumbar curve, are very apt to prove to be osteo-arthritis. This may occur in young adults as well as older people. One must, of course, always think of the possibility of tuberculosis in such cases. Chronic arthritis of the sacro-iliacs may be associated, but is rarely seen without involvement of other portions of the spine. The infiltration of the perispinal soft tissues, as occurs about any chronic arthritis, easily explains the radiating pains so often present. The attitude of the patient in chronic osteo-arthritis is very significant. The normal lumbar curve straightens out or becomes convex posteriorly, evidently Nature's effort to relieve the nerve pressure by opening wider the foramina and interpedicula spaces and giving more room for the nerves and surrounding infiltration of perispinal soft parts. For similar reason sprains of ligaments on one side of the fifth lumbar vertebra may result in the trunk's being inclined to the opposite side (sciatic scoliosis). The over-erect attitude, characteristic of lumbar Pott's disease, is the involuntary effort to relieve pressure on the vertebral bodies.

Skeletal malformations, deformities and defects such as sacralization of the fifth lumbar, supernumerary or absent vertebrae and spina bifida occulta are probably predisposing factors, but their presence in the radiograms of a patient with back pains is often given undue etiologic significance. It is doubtful if surgical removal of a large fifth lumbar transverse process is ever justifiable.

O'Reilly found in the study of a large series of x-ray plates that variations of the lumbo-sacral spine are very common, about 50 per cent being in patients who have never had back symptoms; also, that irregularities at the lumbo-sacral joint are frequent in those without as well as those with back pains. He says that the surgeon, in cases of injury, must be very guarded in stating that there has been displacement or fracture as the result of accident. Likewise it is impossible to say in a given case how much these irregularities have to do with the symptoms. In my experience these patients respond to treatment by rest, immobilization and

physical therapy almost as well as those without any anomaly.

It seems reasonable, then, to consider that these abnormalities are to some extent predisposing factors to strains and sprains of the lumbo-sacral and lumbar joints, but that trauma and infection are the real or exciting causes in most instances.

(Class 5) Intra-abdominal and pelvic conditions, such as kidney stone or infection, pregnancy, tumors, malpositions of uterus, prostatitis, etc., are no doubt factors in a small per cent of cases of back pain and should always be considered. If looked for in examining the patients, they can usually be distinguished from the genuine back cases.

It is not within the scope of this paper to discuss treatment. Some of the more important points which I wish to call attention to are: first, most back pains are to be divided etiologically into five groups, viz: (1) traumatic, (2) postural (including pregnancy), (3) diseases of lumbar and sacro-iliac regions, (4) skeletal anomalies, (5) abdominal and pelvic pathology.

Second, the mild or moderate degrees of trauma are most often sprains of the ligaments of the lumbo-sacral and lumbar joints. Injury to the sacro-iliac joints is far less frequent, because they are less vulnerable.

Third, sciatica and other referred pains are generally due to nerve irritation from disease or trauma in the lower lumbar region, particularly from infiltration or effusion into soft parts about the nerve exits.

Fourth, pain in the postural cases is due to undue muscular and ligamentous strain from faulty attitudes and weak muscles, and is comparable to that of foot strain. Here also it is believed that the lumbar ligaments suffer more than the sacro-iliac, as lumbar joints are more dependent on muscular support.

Fifth, diseases of the lumbar spine, particularly local and diffuse osteo-arthritis, are probably a more common cause of low back pain than has been believed. The chronic processes are not demonstrable by the x-rays until long after the onset of symptoms, or possibly not at all, as in atrophic osteo-arthritis. An arthritic spine is very sensitive to even slight strains.

Sixth, the posture of the patient, attitude of the trunk, and type of spinal curve are significant as to the location and nature of the trouble.

Seventh, genuine disability due to trauma or disease is manifested by definite objective signs such as involuntary spasm of the lumbar muscles, persistent limitation of lumbar movements, abnormal lumbar curves, fixed faulty attitude of the trunk, or persistently and consistently guarded movements. Without one or more of these signs the case is to be classed as a malingerer, a neurasthenic, or a mild static strain (postural case).

Eighth, a most careful study should be made of all low back and sciatic cases in an effort to arrive at a definite diagnosis if possible, especially in medico-legal and compensation cases.

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DISCUSSION

Dr. E. Laurence Scott, Birmingham, Ala.—The more I study with the x-ray the causative factors in mild or simple backaches, and the more I read, the less I feel I know about them.

I have a specimen of an osteo-arthritic spine, which I have asked Dr. Brackett to show to us.

Dr. E. G. Brackett, Boston, Mass.—When I begin on a discussion of the low back pains I feel as if I entered a crystal maze.

There is one type of back of which one sees a great deal, a study of which helps in general diagnosis. One finds many cases with complaint of low back pain and little or no leg pain. On examination one finds a loss of the uniform curve in the lumbar region, and there is a sharp angular bend forward at the lumbo-sacral junction. Instead of the lumbar curve increasing in forward bending, there is very little change, but in backward bending, the motion in the low back is almost like a hinge in the lumbo-sacral area. In this type, one is likely to find constant, severe low back pain with little or no leg pain. Undoubtedly this is due to ligamentous strain and has little or nothing to do with the sacro-iliac joint.

The most marked feature in Dr. Scott's specimen is the perfect ankylosis of the sacro-iliac joint, a condition found in a good many museum specimens. When Nature has a loose joint, or any point of irritation, she throws out a protective buttress and attempts to limit the motion by ankylosing the part. This spine also shows more or less of a general process, more active in certain parts of the spine and with evidence of a real destruction, but at the same time a distinct

outgrowth in the same area. The general appearance of this as well as its density seems to me enough to throw out the diagnosis of tuberculosis, particularly with the very extensive areas of lipping of the edges of the vertebrae. It would appear to be a part of some general infectious process, for the general appearance resembles so much that which we find in our clinical specimens by the x-ray. I think that all we can do with a specimen of this sort is to feel that we are dealing with a destructive process of the deformative type in which there has been a certain amount of absorption of the vertebral discs and lipping all about. Certainly, it is a very unusual specimen and is undoubtedly one of the infectious type which would probably end in a so-called poker back.

Dr. G. E. Bennett, Baltimore, Md.—I have been particularly interested in the group of cases following lumbar punctures on which Dr. Billington reported. I have never been able to decide whether the pain was the result of the unusual strain that the spine was placed under at the time of puncture, or whether it was the result of some trauma due to the needle passing through the intervertebral cartilage, injuring the meninges or producing an actual bony injury to the bodies of the vertebrae. I believe that further concentrated study upon this particular group of cases will be of great assistance to us in clearing up this questionable point. I should like to add that osteomyelitis of the spine from an accidental infection is possible. I have seen a case of an osteomyelitis of a body of the vertebra from spinal puncture.

Dr. F. W. Carruthers, Little Rock, Ark.—Many of these conditions are due simply to myositis of the lumbar muscles, as well as to a low grade inflammation of the ligaments. The blood supply in these regions is very poor, and when a condition of this kind starts up it is difficult to get rid of.

Another thing to take into consideration in questioning people is whether they have ever had an anesthetic. Many times, when people are on the operating table, there is a relaxation of the lumbar region.

Many of these conditions are a low grade osteo-arthritis and secondary to some focal infection. Many are low grade osteo-arthritis which we are not able to determine by the x-ray, and we have to depend upon the physical findings more than anything else.

Dr. Robert F. Patterson, Knoxville, Tenn.—I have had occasion to see a good many cases of persistent pain following lumbar puncture in connection with public health work, and I have been accustomed to attribute a certain neurotic element to such cases. I have never seen one yet that could not tell you exactly how many punctures he had had. Furthermore, I have been unable to make up my mind that there would be a definite pathology two or three or four years after the puncture by a little needle, so I have felt all along that many of these cases are pure neuroses, following the very definite pain at the time of the puncture.

I am also interested in cases of low back pain in parturient women. I would like to know if Dr. Billington thinks it is postural, and whether the pain occurring before labor is due to the weight and increased curve incident to the condition, and also what is the condition that follows labor, whether or not that is a sacro-iliac strain. We do know that in many of these cases simply putting on a sacro-iliac support will give complete relief.

Dr. Theodore Toepel, Atlanta, Ga.—I saw recently a patient who was suffering with pain in the lower back. After a thorough examination, including the review of an x-ray, which proved negative, the subject of constipation was discussed and the patient admitted having suffered with chronic constipation for years. A further examination revealed an advanced case of external hemorrhoids. This case was referred to a general surgeon and after a successful removal of the hemorrhoids, the pains in the lower back disappeared and up to date have not returned.

Another point of interest is low back pains in pregnancy in connection with trauma. When a woman who is pregnant meets with an accident, during or after the sixth month of pregnancy, such as stepping off a moving vehicle or being thrown off, or falling down the steps, invariably a stretching of the ligaments of the sacro-iliac joint will take place, which, in my opinion, will produce one of the meanest low back pains, both from the point of view of the patient as to the amount of suffering and from the point of view of the surgeon as to a successful treatment of such a case.

Dr. Billington (closing).—Many cases following spinal punctures are probably due to the same cause as the headaches which we cannot lay to nervousness and hysteria, by any means, probably due to meningeal adhesions. Four or five of my cases showed distinct osteo-arthritis of one intervertebral joint, and one or two showed multiple hypertrophic changes, which perhaps had no connection with the spinal puncture condition at all. But these four or five cases showed a definitely localized thinning of the disc and roughening of a lower lumbar joint. The x-ray picture was clear cut and the margins were distinct, with no blurring of the picture at all suggestive of a tuberculous condition. One had extreme pain, not only in the back, but in the legs as well.

Myositis is something that I do not take much stock in. I think Dr. Carruthers is right in saying that many of these cases are osteo-arthritic cases which come to us before any definite change has taken place and which are difficult to diagnose.

Cases in pregnant women are to be classed as postural. The amount of strain is enough to cause pain, just as an abnormal amount of walking or standing on a foot that is not too strong will cause pain in the foot.

EYE, EAR, NOSE AND THROAT

BRAIN ABSCESS OF TEMPORO-SPHENOIDAL LOBE COMPLICATING ACUTE MASTOIDITIS: OPERATION AND RECOVERY*

By Elbyrne G. Gill, M.D.,
Roanoke, Va.

The patient, L. L. B., a female, age 41, came under my observation on April 22, 1922, complaining of deafness in the left ear. This symptom was preceded by a "cold."

She had had no previous history of ear trouble, had had the diseases of childhood, and was in a tuberculosis sanitarium for treatment for eight months, five years previously. She had had no further trouble.

Special Examinations.—Nose, negative. Throat, tonsils small, submerged and diseased. Ears, A. D. normal; A. S. membrani tympani thickened and slightly congested. Sinuses, maxillary and frontal all clear to transillumination.

Functional examination:

	Whisper	Weber	Schwaback	Rinne
Right ear	25 ft.	—	—	+
Left ear	3 ft.	+	+	—

	Lower Tone	Galton Whistle	
Right ear	C- 32	.2	Fistula
Left ear	C-128	.2	Negative

Diagnosis at this time was tubo-tympanic congestion following acute rhinitis.

Four days later, April 26, I was called to see her and on examination revealed a bulging left ear drum. She was suffering most excruciating pain. The ear drum was incised under local anesthesia and pus escaped under pressure. Examination of smear revealed pneumococcus infection. The patient was treated for acute middle ear suppuration and had no further trouble until April 30 (four days later), when she began having severe pains in the left ear. At this time there was slight tenderness, on pressure, over the mastoid antrum and tip. The aural discharge was thick and profuse.

As I was leaving the city at this time for a few days, my colleague, Dr. G. M. Maxwell, kindly consented to look after the patient. Her condition grew progressively worse and on Wednesday morning, May 3, Dr. Maxwell sent her to the hospital for x-ray examination, preparatory to doing a mastoidectomy. The x-ray report is as follows: "X-ray examination of left ear shows a definite increased density and cloudiness of the mastoid. The cells do not appear to be completely broken down, but there is a definite involvement, and this case should be carefully watched clinically, with an idea of early operative procedure."

After receiving this report and noting the severity of the clinical symptoms, operation was advised. She refused and left the hospital on the day of admission, May 3. I returned to the city May 6, visited the patient at home, and found the condition as follows: pulse and temperature normal, profuse ropy discharge from the ear, no pain, tenderness only on pressure over the mastoid tip, emaciation noticeable. The pupils were equal in size and reacted to light, there was no spontaneous nystagmus, the eye grounds were negative, and there was apparent cloudiness of the sensorium. The patient was urged to return to the hospital for another x-ray examination, but refused. The family was advised to notify me if any unfavorable symptoms developed. The following morning, May 7, at 5 o'clock, I received a telephone call stating that the patient was unconscious and was having convulsions. On reaching the home I found her unconscious. Rotary nystagmus to the right was noticed. The patient was hurried to the hospital and spinal puncture was performed immediately. Fifteen cubic centimeters of fluid were withdrawn. The first fluid was blood-tinged, the last only faintly cloudy. The cloudiness was due to blood. Blood count: 3,480,000 red blood cells, hemoglobin 60 per cent, white blood cells 22,600, with 90 per cent neutrophiles, and 10 per cent mononuclears. The urine was negative.

Sudden development of this unfavorable symptom prevented a satisfactory neurological and Barany examination, and consequently we were not able to localize a definite lesion. Her temperature on admission was 100° F., pulse 100, and respiration 18.

From the history of suppurating middle ear and mastoiditis for the past ten days, followed by sudden development of unconsciousness and a negative spinal fluid and urine, we made a tentative diagnosis of an abscess of the temporosphenoidal lobe.

The family was advised accordingly and after much persuasion we were permitted to operate.

The patient was prepared as usual for a mastoid operation. She was in profound coma when sent to the operating room. A simple mastoidectomy was performed. A small amount of pus escaped when the mastoid cortex was removed. There was no pus in the antrum, tip or over the lateral sinus. The lateral sinus was uncovered from the knee to the sigmoid. The color was normal. There was no evidence of necrosis of the bone covering the sinus. The cerebellar dura was normal in appearance. Nothing had been found so far to account for the symptoms present. The dura in the middle cranial fossa was uncovered to the extent of a twenty-five-cent piece. The dural plate was intact and there was

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no evidence of necrosis. The dura was red, congested, covered with granulations, and bulging. There was no pulsation, and it was not adherent to the bony wall.

All instruments used in the operation were removed from the table, gloves were changed, and the mastoid cavity was swabbed with iodin,

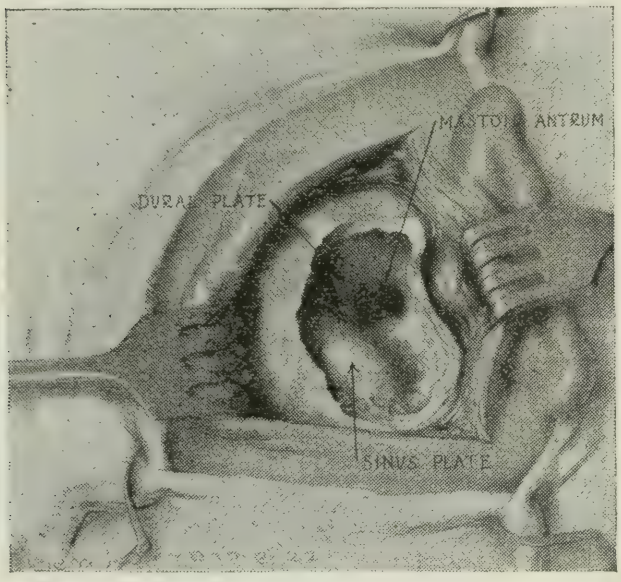


Fig. 1.—Showing mastoid antrum, sinus and dural plate.

full strength. The dura was incised in the middle fossa. The knife was inserted into the brain to the depth of two inches. No pus escaped. I then opened the incision by spreading apart a pair of forceps. When this was done, about two ounces of unorganized pus escaped under

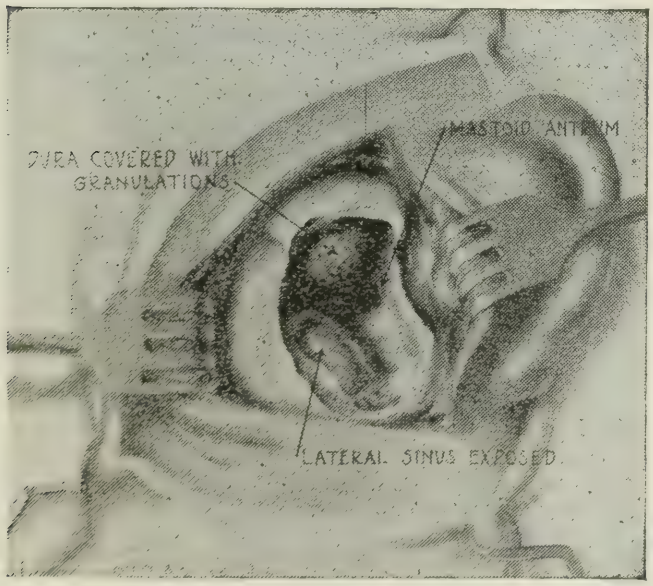


Fig. 2.—Showing mastoid antrum, dura in the middle fossa exposed and the lateral sinus exposed.

pressure. The pus had no odor and there was apparently no abscess wall. A culture showed pneumococcus infection.

A small rubber cigarette drain was then inserted into the brain cavity and held in place by packing placed around it in the mastoid cavity. The mastoid wound was left open. A dressing was applied and the patient sent back to her room in good condition, temperature 100.4°, pulse 120, and respiration 24. The time of operation was one hour and thirty minutes.

Four hours following operation the patient regained consciousness and her subsequent history was one of gradual improvement. The first two weeks following operation she had marked word aphasia and weakness of the muscles of the right arm persisted for nearly three months.

When the drainage tube should be removed was a question of paramount importance. At the end of the first week the discharge from the tube was very slight and of a serous nature and this with the improvement in the general condition prompted me to remove the tube. On the following day the patient complained of severe headache and there was a beginning cloudiness of the sensorium. The dural incision was again

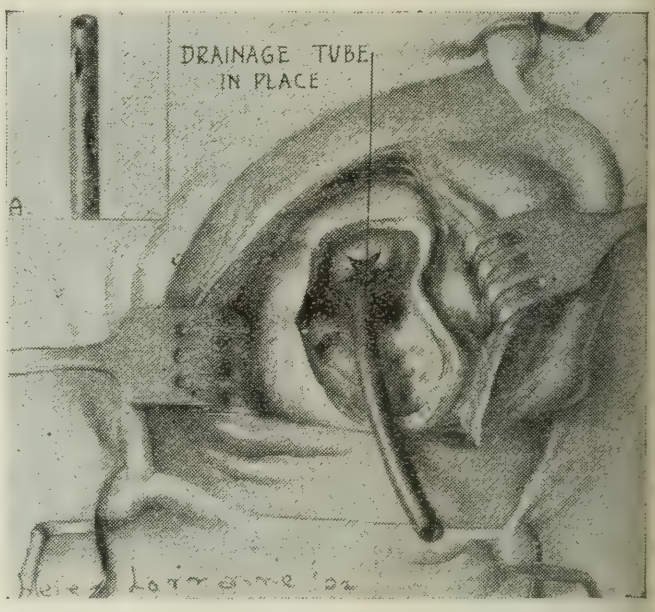


Fig. 3.—Showing male catheter in the brain cavity for drainage.

opened with the forceps and dark blood-tinged pus was evacuated. A small male catheter was inserted into the cavity and allowed to remain until May 25, nearly three weeks following the operation. The tube was changed only twice during this period, and then on account of the dressing slipping.

The anemia which was present at the time of admission continued to become more marked as shown by the following blood pictures:

May	8	Red blood cells	3,480,00
		Hemoglobin	60
		White blood cells	22,60
		Polymorphonuclears	90
		Mononuclears	10
	22	Red blood cells	3,080,00
		Hemoglobin	45
		White blood cells	10,00
		Polymorphonuclears	80
		Mononuclears	20

24	Red blood cells	3,420,000
	Hemoglobin	50%
	White blood cells	9,400
	Polymorphonuclears	76%
	Mononuclears	24%
26	Red blood cells	3,600,000
	Hemoglobin	55%
	White blood cells	8,800
	Polymorphonuclears	77%
	Mononuclears	23%
30	Red blood cells	3,480,000
	Hemoglobin	55%
	White blood cells	7,800
	Polymorphonuclears	76%
	Mononuclears	24%
June 2	Red blood cells	2,800,000
	Hemoglobin	50%
	White blood cells	5,400
	Polymorphonuclears	65%
	Mononuclears	35%
8	Red blood cells	2,440,000
	Hemoglobin	50%
	White blood cells	6,000
	Polymorphonuclears	68%
	Mononuclears	32%

At this time blood transfusion was decided upon as the most effective means to combat the progressive anemia. A suitable donor was selected and a transfusion of 250 c. c. of blood was given June 10. A very severe reaction accompanied the transfusion. Blood count June 15 was as follows:

Red blood cells	4,360,000
Hemoglobin	65%
White blood cells	7,800
Polymorphonuclears	70%
Mononuclears	29%
Eosinophiles	1%

The patient's general condition was very much improved, the mastoid wound was practically healed and she was discharged from the hospital June 18, 1922.

In this case we had the rapid development of a large abscess without any focalizing symptoms. The patient, as late as 10 p. m. May 6, was feeling quite well and talking with neighbors and members of the family. Seven hours later she suddenly became unconscious and began having recurrent convulsions. We attribute our success to the following factors:

(1) That the abscess was evacuated without undue trauma to the cerebral tissue.

(2) That the drainage tube was allowed to remain *in situ* continuously and not removed daily, as this manipulation would tend to break down Nature's barriers, and thus have a tendency to spread the infection. The time to remove the drainage tube depends upon the individual case. It may vary from one week to three months, depending upon the character and amount of discharge. If it no longer contains pus and is of a serous nature, the tube may be removed.

(3) That the patient was kept in bed, on her back, for four weeks following operation.

612 MacBain Building.

DISCUSSION

Dr. Homer J. Dupuy, New Orleans, La.—We have drained with rubber tubing, rubber dams, cigarette gauze drains, and still have had fatal results. The hardest thing, to my mind, is to overcome the possibility of a meningitis following the actual opening of the abscess. In other words, you find the abscess, and the patient does well for five or six days. Then comes the meningeal post-operative complication, and death. We all agree that it is not so difficult to find the abscess, to localize it, and even to open it; but the hardest thing to avoid is the post-operative meningitis. That, I believe, is largely due to the fact that we reach the abscess through the meninges by an ordinary linear incision.

In a recent case, about a year ago, in which success followed the opening of the abscess and in which no post-operative meningitis occurred, I secured this result principally by making a crucial incision into the dura, giving four flaps. Each one is curled over. The object I had in view was to promote hyperplastic inflammation over the dura and reduce the possibility of infection entering the meninges.

We lose a great many of our patients on the eighth or twelfth day, when they have been apparently doing well up to that time. They die from meningitis. I do believe that if we make a crucial incision, with the curled four flaps, it promotes hyperplastic adhesions over the dura and we may prevent to a large extent the meningitis.

A peculiar feature of this case is the absence of slow pulse. My experience has been that in these cases the pulse is usually slow.

Dr. J. T. Townsend, Charleston, S. C.—I saw an interesting method of draining an intracranial abscess at the Surgical Congress in Boston. Dr. Mosher makes a crucial incision in the dura, which crucial incision forms four points where the incisions cross. In each point a suture is placed. He then locates the abscess by needle puncture or grooved director. Using the needle or groove director as a guide he passes his copper gauze wire drain down to the abscess. The drain is held in place by the sutures that were placed in the points by the crucial incision. The copper wire gauze drain is like the old style hard rubber nasal splint. This drain is left in a month or more. If at any time it becomes stopped up, the inner surface of the copper gauze can be curetted clear of material without injury to the brain which is protected by the gauze. When

the discharge stops the sutures are cut and the gauze is slowly forced out.

Dr. F. E. Hasty, Nashville, Tenn.—There is one important working rule, I think, which we as otologists might do well to adopt, and that is, given a case of primary ear trouble with complications developing which are not clear, we should stick to the ear side of it and take the stand more or less that it is up to the internist to prove any of his suspicions of other troubles.

Dr. Gill (closing).—One thing I want to mention in regard to the incision. I made a crucial incision, but if I had to do it again I do not think I would. I would make a linear incision, because one is less liable to have a cerebral hernia. In reviewing the literature I find that is the opinion of men who have had the most experience with brain abscess.

CLINICAL OBSERVATIONS FOLLOWING THE USE OF CYANID OF MERCURY IN LENTICULAR OPACITIES*

By John H. Burleson, M. D.,
San Antonio, Tex.

For some years I have been greatly interested in subconjunctival injections and have probably used them more often than the average oculist. They are the most neglected therapeutic agents in ophthalmic practice. A few years ago, Lieutenant-Colonel Smith, of India, visited the United States, and in an address stated that if he had contributed anything to the science of ophthalmology it was to stress the use of cyanid injections for the arrest and absorption of beginning opacities in the crystalline lens. I was so much impressed with the man's sincerity that I determined to try it.

From a review of the literature of the etiology of incipient cataract we find that it has always been and still is so obscure and uncertain that positive data is lacking. All we have is the opinion of different writers on the subject. Certain facts, however, are accepted by all observers:

(1) That a cataract is the result of degeneration of the fibres and cells of the lens substance.

(2) That primary cataract is nearly always bilateral which would indicate a constitutional change or defect.

(3) That the action of light and heat will produce changes in the lens. With these basic principals generally accepted, we have made our observations upon the theory that primary cataract is due to faulty metabolism or infection which produces tissue change. It would seem to us that primary cataract, however, is never the result in the strict sense of the word of senile degeneration. Physiologists have long taught that toxic doses of certain drugs, introduced into the circulation, will produce changes in the lens.

As early as 1857, Kunde demonstrated that a strong solution of sugar introduced into frogs would produce opacity of the lens and that the opacity would clear up when the animal was replaced in water. In opacity of the lens occurring in children and young adult life, we must regard focal infections as a causative factor. Kunde's experiments also show, and have been verified by other observers since, that an artificially produced edema would fill with fluid the spaces between the lens fibers and would also cause a change in the refraction.

Our observations in the clinical use of cyanid injections consist of a series of some fifty cases, 75 per cent of which would be classified in the senile group, occurring in persons over fifty years of age. The remainder we classify as focal infections occurring in young adult life and childhood.

Our observations embrace all cases coming under our care extending over a period of two years: that these injections produce a most pronounced change in the structure of the lens substance, there is no doubt. When the patient first comes for examination, a careful case history is taken, also an accurate test of vision, followed by an ophthalmoscopic examination under dilatation to determine the extent of the opacity, and if possible the condition of the fundus. If the case is found to be favorable for injection, it is put to bed and prepared for injection the following morning. The method is, first to instill a few drops of a 10 per cent solu-

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

tion of cocain at intervals of two or three minutes until the eye can be handled without causing pain. Then inject 20 mils of 1 per cent solution of cocain under the conjunctiva and wait for three minutes. Cyanid 20 mils of a one to three thousand solution is now injected deep under the external rectus. The method causes little or no pain. The eyelids are then covered with vaseline and a protective dressing applied. The reaction, which is always very uniform, produces a general edema of the orbital cavity. These injections used in a non-inflammatory eye do not produce the amount of reaction seen from the use of cyanid for blocking infectious cases.

The eyes are kept closed for two days, when the patient is permitted to return home. The injections are repeated at intervals of from three weeks to one month, depending on the amount of reaction produced. Three injections are given. In our series of cases, there has not been a single one in which the vision had not been improved, so much so, that the patient will assure us without being questioned that he can see better, vision often being raised from 20/50 to 20/20. Just here I wish to advise that when the vision is below 20/70 injections do not seem to have any effect on the lens. We have had several cases in which the glasses had to be changed to weaker lenses. This improvement continues after the third injection until about the third month, when the vision gradually begins to fail and the cataract goes to maturity. Those cases that relapse all belong to the senile group. It was our good fortune in this group of cases to have several luetic children. These, after more than a year, are still much improved, and I believe have been permanently benefited. There is one case of our series which I would like to report.

J. P. M., age 35, weighed 190 pounds, was in perfect physical health, and had never been sick since the incidents of childhood. The family history was good. He was examined on August 1, 1921, and gave the following history: three months before noticing failing vision he contracted a very severe case of mumps in the right parotid gland. He was confined to bed and had meningitic symptoms. His eyes were crossed. He consulted an oculist as soon as he was able to go to his office. The diagnosis was lues. The Wassermanns, both blood and spinal fluid, were negative.

These examinations were followed by six intravenous injections of arsphenamin. He took medicine for one year, though his vision continued to grow worse. He became despondent and discontinued treatment. One year after no treatment at all, he consulted us. Vision O. D. objects at one foot, O. S. 20/50. The reduced vision in the left eye caused him to seek relief, as he was fearful of blindness. The patient was an educated man and was told frankly all we knew about the cyanid injection. He suggested that we try it first on his blind eye and see the result. It was explained to him that the lens was so opaque that we expected no result, and it was not a fair test. However, the eye was injected and both to my surprise and his, vision was brought up to 20/100. After this result he consented to have the good eye injected. When he was examined on September 8, 1922, one year after treatment, vision was O. D. 20/70, O. S. 20/30.

From this and similar cases treated, we believe that where opacities can be traced to a definite infection, cyanid injections not only do good, but the result is permanent.

The difference in results obtained by Colonel Smith and me can be explained in the causative factor. Probably his cases represent a preponderance of infections. It may also be true that, being in a tropical country like India, opacities caused by heat and glare are especially amenable to this treatment.

In assigning a cause as to why the so-called senile opacity should relapse, we can look only to nutritional disturbance. Kunde's experiments on animals and the recognized predisposition of diabetics to cataract lead me to discuss this phase of the subject with Dr. W. E. Nesbit, an internist with whom I work. He advanced the idea that possibly all senile cataracts were potential diabetics and to him I am indebted for the blood chemistry of this report.

The cases upon whom blood sugar determinations were made were not especially selected, but are the last twenty cases of lenticular opacities coming under my care for observation and treatment.

The analysis of these twenty cases is briefly as follows: all of the series had definite opacities of the crystalline lens.

In all cases in this series the opacities were bilateral. The degree of opacity varied in some cases and was greater in one eye than in the other. Thirteen, or 65 per cent, were from ten to sixty pounds overweight. As to sex, twelve were males and eight females. All but two of these cases were fifty years of age or over.

The blood sugar determinations were made according to the Lewis-Benedict colorimetric method. The blood was taken before breakfast after the patient had finished a fourteen-hour fast. Coagulation of the blood was prevented by oxalate crystals and precipitated with saturated picric acid solution within an hour after securing the sample. Seventeen of the twenty cases showed an increased blood sugar percentage.

The lowest finding in this series was 0.124 per cent gm. per liter, the highest 3.00 gm. per liter. The urines of all these cases were free from sugar on testing with Fehling's solution and Benedict's qualitative solution. Those cases in which the highest blood sugar percentage was found were patients who were a great deal overweight and whose urine showed a trace of albumin and an occasional cast. The absence of sugar in the urine is probably explained by assuming that the threshold is raised by kidney disease or degeneration.

To determine whether these increased blood sugar values were examples of alimentary hyperglycemia or were true prediabetic hyperglycemia, a number were selected for glucose tolerance tests.

It has not been possible to give the data on the glucose tolerance of all these cases, since it has been impossible to get sufficient co-operation from the patient. However, it has been possible to determine the glucose tolerance in three of the cases with the highest blood sugar percentages.

The glucose tolerance test was performed as follows: the first sample of blood was taken at the end of a fourteen-hour fasting period. The patient was then given 1.75 gm. of glucose per kilogram of body weight.* To make the dose palatable, the glucose was given in 40 per cent solution with the addition of the juice of two or three lemons.

Following the administration of the glucose, samples of blood were taken one, two, and three hours afterward. It is my intention to reserve these tolerance curves for future publication, in order to have more detailed data. The tolerance curves in these three cases showed a height which was not reached until some time after the first hour had elapsed. The curves had not returned to the normal base line at the end of the third hour. This type of curve is identical with that found in early diabetes. I am not in a position to say what the tolerance test will show in the average of these cases, but reserve that for some future time.

SUMMARY

All cases injected showed improvement. Those with metabolic disturbance relapsed.

All cases traceable to infection have apparently been benefited.

Twenty cases showing opacities of the crystalline lens have been studied to determine the relation of the blood sugar to etiology.

Seventeen of the twenty cases showed an increased blood sugar percentage.

The lowest blood sugar was 1.24 gm. per liter; the highest was 3.00 gm. per liter.

Graded glucose tolerance tests on three of these cases showed blood sugar curves similar to those found in early diabetes.

DISCUSSION

Dr. Wallace Ralston, Houston, Tex.—I also heard Colonel Smith take up this subject at the same time that Dr. Burleson heard him. He made some rather interesting observations, but he did not get down to the theory of cataract. Dr. Burleson's suggestion, the blood chemistry, appeals to me as being really worth while. Recently Mr. Treachor Collins wrote a paper going into the nutritional condition of the eye.

I have seen some incipient cataract cases clear

*Janney and Isaacson: J. A. M. A., 70:1131, April 20, 1918.

up under other treatments, such as dionin, and we shall, I think, hear more and more about that later.

Dr. G. C. Savage, Nashville, Tenn.—I have been long convinced that people with incipient cataract ought not to be discouraged by being told that nothing can be done for them. I have not resorted to cyanid injections, but I have many times prepared, for patients with incipient cataract, a solution that is easily made by any druggist. It is 2 grains of bichlorid of mercury and 4 drams of iodid of potassium, in distilled water 2 ounces. The directions I write on this prescription are to take 5 drops in water after each meal for five weeks, then rest one week; another five weeks, rest one; another five weeks, rest one, and so on. No bad effect could come from the administration of such a small dose of bichlorid and iodid. It is about 1/100 of a grain of bichlorid to 1 grain of potassium iodid. I tell the patients to "take it as long as it keeps you from seeing worse than you do now." I have seen cases improve, and one of them, a physician of Nashville, would have been blind several years before his death if it had not been for his faithful taking of this combination.

Another case, the division superintendent of one of our railroads in Tennessee, had a vision of 20/50 when I saw him. He had noticed that his vision was failing for some time, but did not know what was the matter. It was incipient cataract. I gave him that prescription and his vision came up to 20/20 and remained there until his death at about the age of 76, a few months ago.

I have had literally hundreds of cases of incipient cataract to whom I have administered this agent, and the greater percentage have either held their own, or have had some improvement.

My suspicion is always aroused when a patient comes to me who has been wearing glasses to read, and suddenly discovers that he can read well without lenses. That is second sight, which is always a forerunner of cataractous changes.

Dr. O. H. King, Hot Springs, Ark.—In 1913-14, while I was with Dr. Knapp in Vincennes, we worked out 25 cases of incipient cataract, injecting one eye with cyanid of mercury subconjunctivally, while in the other we used dionin, 5 to 10 per cent, beginning with the weaker solution and working up to the stronger solution. These cases were reported before the Indiana State Medical Association in 1914. Our experience was about the same as that of Dr. Burleson. The younger the case and the more recent the opacity, the better result we obtained. The comparison was very much in favor of the injection of cyanid or mercury as against dionin instillation.

I cannot say how long some of these cases remained improved. Some of them we improved from 20/40 and 20/50 to 20/30, and in only one case were we able to get anything like 20/20. The cases with greater opacity and of long standing improved very little, and those with an opacity sufficient to prevent us from seeing the grounds were almost unchanged by the injections. These cases have not been followed up, for the reason that I left Dr. Knapp soon after that and have not been in touch with him recently. But we were favorably impressed with the injections at that time.

Dr. Walter B. Lancaster, Boston, Mass.—What we need about this subject is more information as to the natural history of cataract. How do cataracts, taken by the thousands, progress in five or ten years when untreated? Until we know the definite natural history we are misled many times by thinking that the improvement, which is well known to occur in many untreated cases, is due to our treatment. Those who are therapeutic pessimists will therefore reject all treatment; but being myself a therapeutic optimist, I give the credit to the medicine and keep on using it.

Dr. Wilson E. Driver, Norfolk, Va.—We know that cataracts are produced by physical and chemical conditions. Lumiere's idea is that under certain conditions normal colloids cease to exist and there is a "flocculation of micellae." This is an illuminating viewpoint.

Dr. Burleson (closing).—I do not believe that cyanid injections do anything except give temporary relief in the sclerotic type of cataract after it has developed to a certain stage. But where the cataract can be traced to a definite infection, cyanid injections not only do good but the improvement is permanent. I recall one case in a child that had all the classical symptoms of luetic congenital cataract. This child was about three years old and absolutely helpless; unable to feed itself or play with other children. It was injected with cyanid and was seen six months afterward, when it had object vision and was able to play and take care of itself.

In the early stages of beginning cataract, by cyanid injections combined with strict diet, the sclerosis can be stopped and blindness prevented. I now have several patients under observation in which this has been accomplished for more than a year. I hope to be able to continue my investigations and present them to this society at some future date.

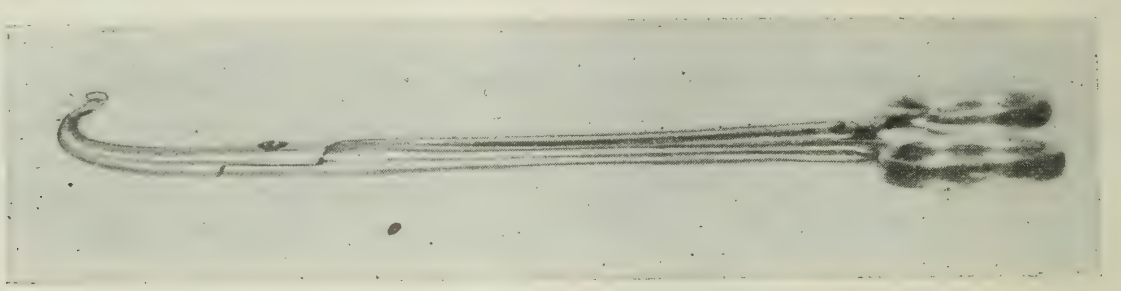
A NEW HEMOSTATIC FORCEPS

By Wm. B. McWhorter, M.D.,
Anderson, S. C.

Of the writing of many books and the making of surgical instruments, there is no end. Especially is this true of instruments for the tonsil operation. Nevertheless, the instrument shown in the cut is different from anything on the market and is very simple and useful, especially in throat work.

The only sure way to prevent hemorrhage after a tonsil operation is to ligate all the bleeding points as soon as the tonsil has been removed. With a straight or slightly curved forceps it is difficult to ligate the vessels in the throat, due to the fact that the end of the hemostat is often caught in the knot, it being difficult to push the knot off the end of the hemostat while tying it.

The hemostat shown in the cut avoids this trouble. It has a one hundred and eighty degree curve with a notch on the distal curve near the end. The extreme curve of the instrument allows the distal portion to remain free when the bleeding point is grasped. The cat gut is then passed beneath the free distal end and slipped into the notch which holds the suture back while the knot is being tied on the opposite side of the instrument. As the knot is tied, it slips around the distal curve of the hemostat and catches the bleeding point previously grasped. The hemostat is then removed.



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DR. M. Y. DABNEY, Editor
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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
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TREATMENT OF CERTAIN CASES OF EPIDEMIC CEREBRO-SPINAL MENINGITIS

The results that followed the use of Flexner's anti-meningococcic serum introduced by the lumbar route were, from the beginning, very encouraging. Whereas the mortality before the use of this serum in epidemic cerebro-spinal meningitis was around 75 per cent and only 25 per cent of the patients recovered, it was found that these figures could be reversed by administering the specific serum in sufficient quantities by the lumbar route. There still remained, however, a mortality of at least 25 per cent. It is little wonder, therefore, that clinicians have been endeavoring during recent years to discover methods of further reducing the death rate in the disease. It is gratifying to know that some progress has been made. In cases in which the introduction of the serum by the lumbar route is not sufficiently efficacious, good results can sometimes be obtained by introducing it into the cisterna magna, into the lateral ventricle of the brain, or into the subdural space over the cerebrum.

During the past three years, the indications for cistern puncture have been learned. In some cases of epidemic cerebro-spinal meningitis, on lumbar puncture the fluid comes out under greatly decreased pressure, appearing only drop by drop. Indeed, sometimes one gets a dry tap. In these cases the small yield of fluid by lumbar puncture is most often due to the existence of a block somewhere in the subarachnoid space within the spinal canal, this "block" being due to thick exudate or to adhesions. If such a block exist a cistern puncture may be made at the back of the neck and serum introduced through this route. The technic of cistern puncture has been well described by Ayer in the *Archives of Neurology and Psychiatry* for November, 1920.

In many cases of epidemic cerebro-spinal meningitis there is a ventriculitis as well as a meningitis and the degree of ventriculitis that exists may be of real importance for the prognosis in a given case. Sometimes as a result of the ventriculitis the communications between the ventricles and the subarachnoid space become closed and an internal hydrocephalus develops. In such instances, ventricular puncture, followed by the introduction of the immune serum into the ventricle, may be life-saving. Indeed, sometimes the closed communications may be reopened and the internal hydrocephalus cured.

Ventricular puncture is very simple in infants, when the fontanel can be penetrated by a needle. The technic has been well described by Howell and Cohen in the *American Journal of Diseases of Children* for November, 1922.

When intra-ventricular therapy is indicated in an adult suffering from epidemic cerebro-spinal meningitis it is necessary to trephine the skull in order to perform ventricular puncture. But this is not a

difficult procedure in the hands of a trained surgeon and it should be resorted to in cases in which internal hydrocephalus develops in the course of an epidemic cerebro-spinal meningitis.

In patients who in the course of epidemic cerebro-spinal meningitis show signs of severe cortical irritation the immune serum may be introduced directly beneath the dura over the cerebral cortex, first on one side and then on the other. This, too, is a measure easy to apply in infants, the needle being inserted at the lateral edge of the fontanel on each side, the dura being pierced and the serum injected. In adults the matter is more complicated since trephining is necessary first.

A review of the literature convinces one of the desirability of applying these newer methods in the treatment of certain cases of epidemic cerebro-spinal meningitis. Though they need not be resorted to except in special cases, the recognition of the instances in which they may be helpful should go far toward reducing still further the mortality of a much dreaded disease.

LIABILITY IN FRACTURES

Bad results in cases of fractures and bone diseases are seldom buried, but are a living monument to one's mistake or ill-luck. They seem to be leading factors in longevity. Often the bad result is not the fault of the surgeon; but unfortunately sometimes it may be. If the surgeon were always careful to observe certain simple rules, much of the difficulty of these cases would be avoided.

In fractures one should remember that swelling always occurs after manipulating or "setting," and instructions should be given the patient to notify the physician if the bandages become too tight. Twenty-four hours after the application of any form of splint, the case should always be seen again and the bandages readjusted if necessary.

Severe pain should not persist after a simple fracture has been properly set and dressed.

An x-ray should always be taken after the fracture has been set and dressings have been applied. The public generally has been educated to expect it, and juries are inclined to consider it essential. It is worth considerable trouble and a long trip if necessary to be sure one is right.

Another dangerous pitfall is the making of a diagnosis of "rheumatism" and later finding the entire shaft of a bone destroyed by osteomyelitis. Acute osteomyelitis is a real surgical emergency, and to overlook such a case or to call it "rheumatism" is just as dangerous as calling an acute appendicitis an attack of "colic."

There is a fair number of fracture cases which will turn out badly no matter how skillful the treatment, and upon these the surgeon is as liable to suit for malpractice as in the case where the treatment may have been inexpert. It is no disgrace to be sued for malpractice, but often a sign that a physician has been successful; for the suits are usually brought against men who can afford to pay the damages. However, it is a nuisance, a great waste of time, energy, and money, and is to be avoided to the utmost of our ability. Very careful and painstaking methods of diagnosis and of handling fracture cases will aid in reducing the surgeon's liability. These columns have previously stressed the importance and desirability of having a special fracture service in every large hospital.

Correspondence

ISCHIO-RECTAL DRAINAGE FOR APPENDICEAL ABSCESS

Editor, SOUTHERN MEDICAL JOURNAL:

Reading the article on appendicitis by Dr. Jabez N. Jackson in the April number of the SOUTHERN MEDICAL JOURNAL, I noted in the discussion by Dr. Francis LeS. Reeder, of St. Louis, Mo., his mention of draining appendiceal abscess in the retrocecal cases through the rectum.

It was nineteen years ago that I desired to get away from this method practiced at that time in order to avoid the many unpleasant consequences which so often attended operations on this class of cases through the abdominal route and drainage by loose gauze packed in between the layers of intestines and about them. Owing to our lack of knowledge of the real value of the Fowler position and proper method of placement of drains, patients so frequently developed post-operative intestinal obstruction, from mild to very severe forms, at times calling for second operation for the obstruction a few days after the first operation, or as sometimes a few weeks or months after these patients left the hospital with healed wound.

Occasionally, intestinal rupture, usually about the site of the base of the appendix in the cecum, would occur while these patients were still in the hospital and thus afford relief; others died of a septic condition of the peritoneum (peritonitis), to which at that time I frequently referred with the term peritoneal sepsis.

Having successfully drained a female patient by incision through Douglas' pouch and evacuating the abscess, I was able to bring down the gangrenous appendix, ligate it at its base and remove it. I was stimulated to attempt some method to handle successfully these abscess cases in the male and thus avoid attacking them by rectal puncture for drainage. Therefore, I devised the plan of opening these abscesses through the ischio-rectal space on the right side. The method proved both easy and feasible.

I showed a photograph and read an account of it at the time before the Baltimore City Medical Society. An incision was made on the right side about 10 to 12 cm. long, midway between the tuberosity of the ischium and the anus, the center of the incision being at that point. After cutting through the skin the rest of the operation was practically blunt dissection until the point of opening the abscess was reached.

A blunt retractor with a blade 7.5 cm. long (three inches) was introduced in the wound, and the rectum was held over to the left side, giving better access, and safeguarding the rectum from injury.

The abscess was then opened with a knife; the wound enlarged with a pair of blunt-pointed scissors; the pus evacuated; and drainage made of gauze wrapped in thin rubber tissue.

In all, we did twelve cases successfully that day, and in three of them we were able to remove the appendix. All the patients recovered. Patients suffered no special discomfort and drainage was successful. Also, we had no fear of contamination, as is the case with drainage through the rectum.

Since we have been setting these patients up in the Fowler position and draining the lower pelvis, as recommended by the late Dr. J. B. Murphy, of Chicago, we have had no occasion to resort to this method, which I devised at that time as one of expediency.

Respectfully yours,

F. J. KIRBY, M.D.

Baltimore, Md., May 10, 1923.

Southern Medical News

ALABAMA

The Alabama State Medical Association, at its recent meeting in Mobile, elected the following officers: Dr. W. W. Harper, Selma, President; Drs. James M. Watkins, Troy, and Elijah M. Harris, Russellville, Vice-Presidents; Dr. Henry G. Perry, Montgomery, Secretary; Dr. Jacob U. Ray, Woodstock, Treasurer.

The entire staff of the U. S. Veterans' Bureau Hospital at Tuskegee will be composed of colored men and women. The capacity of the Hospital will be about 600 beds.

Dr. Earle F. Moody, Dothan, has recently completed an annex to the Moody Hospital, which gives it a capacity of 100 beds.

The contract has been let for the erection of a new hospital at Jasper to cost $75,000.

Dr. A. S. Frasier, Dothan, will soon begin work on the annex to the Frasier Hospital, which will increase the capacity to probably 100 beds.

The Memorial Hospital, Brewton, was recently opened. Dr. R. A. Smith and Dr. M. H. Hagood are in charge.

Druid City Hospital, Tuscaloosa, was opened March 26.

Dr. John C. Bragg, Albany, has been elected a member of the Board of Health, succeeding the late Dr. W. M. Dinsmore.

Dr. W. Grady Page, Dothan, and Miss Coral Helene Dekle, Mariana, Fla., were married April 26.

Deaths

Dr. Lewis Whaley, Birmingham, aged 75, was instantly killed March 15 when the automobile in which he was driving was struck by a train.

Dr. William Madison Dinsmore, Decatur, aged 43, died in a hospital in Nashville, Tenn., April 18 from septicemia.

Dr. Joseph Benjamin Robinson, Birmingham, aged 74, died April 13.

Dr. Clifford Nathan Thomas Barnett, Deatsville, aged 46, died April 2.

ARKANSAS

The Arkansas State Medical Society, at its recent meeting in Hot Springs, elected the following officers: Dr. W. T. Wootton, Hot Springs, President; Dr. A. Graves, Lockesburg, and Dr. J. O. Bush, Forrest City, Vice-Presidents; Dr. W. R. Bathurst, Little Rock, Secretary; Dr. R. L. Saxon, Little Rock, Treasurer.

Crawford County Medical Society has elected Dr. S. D. Kirkland, Van Buren, President; Dr. W. R. Reves, Alma, Vice-President; Dr. S. C. Grant, Mulberry, Secretary; Dr. J. A. Wigley, Mulberry, Treasurer.

Desha County Medical Society has elected Dr. H. T. Smith, McGehee, President; Dr. W. H. DeClark, McGehee, Secretary-Treasurer. Both were re-elected.

Searcy County Medical Society has elected Dr. Edward W. Wood, President; Dr. James A. Henley, Vice-President; Dr. Sam G. Daniel, Secretary-Treasurer.

Drs. J. R. Dale, Texarkana, and Dr. Robert Caldwell, Little Rock, have been appointed honorary members of the Board for the State Hospital for Nervous Diseases and Hospital Dairy Farm.

Deaths

Dr. Albert G. Pierce, Blytheville, aged 63, died April 5.

Dr. James Robert Black, Marked Tree, aged 64, died suddenly March 30 from heart disease.

Dr. George Washington Hart, Hartwell, aged 34, died April 13.

Dr. William R. Greeson, Conway, aged 73, died March 28.

DISTRICT OF COLUMBIA

Dr. William J. French, Washington, has been chosen Director of the first demonstration of the child health committee under the Commonwealth Fund Appropriation, which is to be held in Fargo, N. D.

Deaths

Dr. John Robert Lee Hardesty, Washington, aged 87, died February 5.

Dr. William Thompson Burch, Washington, aged 52, died April 10.

FLORIDA

The Florida State Medical Association, at its recent meeting in Jacksonville, elected the following officers: Dr. H. Marshall Taylor, Jacksonville, President; Drs. John C. Vinson, Tampa, R. F. Godard, Quincy, and R. E. McIver, Jacksonville, Vice-Presidents; Dr. Graham E. Henson, Jacksonville, Secretary-Treasurer. Next meeting will be held in Orlando.

Dr. Harold M. Beardall has resigned as City Physician of Orlando and has been succeeded by Dr. Sylvan McElroy.

Deaths

Dr. Frank P. Gillis, Lake Helen, aged 68, died March 12 following a long illness.

GEORGIA

The Medical Association of Georgia, at its recent meeting in Savannah, elected the following officers: Dr. John W. Daniel, Savannah, President; Drs. Alfonso J. Mooney, Statesboro, and Henry C. Whelchel, Douglas, Vice-Presidents; Dr. Allen H. Bunce, Atlanta, Secretary. Augusta was selected for the next meeting place.

The City Hospital, Brunswick, has received from a local industry a donation of $500, which is the second within a few weeks.

Plans for the proposed half million dollar State Tuberculosis Sanatorium, Alto, have been published. There will be administration buildings, two infirmaries, power plant, and laundry. The Legislature will be asked for an appropriation of $250,000 for the buildings, and the counties will pay the remainder.

The Georgia Mental Hygiene Society was reorganized March 8. Ex-Governor Dorsey was elected President and Dr. E. Bates Block, Vice-President.

Dr. G. Y. Moore, Cuthbert, has been appointed Chairman for the American Society for the Control of Cancer for the Third District.

Dr. Lauren Holmes Goldsmith, Atlanta, and Miss Margaret Mason Rowe, Athens, were married April 9.

Deaths

Dr. W. H. McNorrill, Waynesboro, aged 69, died March 16 from pneumonia.

Dr. Marcus U. Nix, Atlanta, aged 66, died February 1 of heart disease.

Dr. Luther Pope Eberhardt, Elberton, aged 53, died March 25 of chronic nephritis and pericarditis.

Dr. Barnett Linton Embry, Villa Rica, aged 70, died April 21.

Dr. David Monroe Buchan, Wray, aged 75, died March 16.

Dr. Joseph E. Durr, Augusta, aged 82, died April 16.

Dr. George Frederick Payne, Atlanta, aged 70, died April 18.

KENTUCKY

The Third District Medical Association has elected Dr. Walter Byrne, Sr., Russellville, President; Dr. F. M. Stites, Hopkinsville, Vice-President; Dr. John H. Blackburn, Bowling Green, Secretary-Treasurer.

The Southwestern Kentucky Medical Association, at its recent meeting, elected Dr. H. H. Hunt, Mayfield, President; Dr. O. R. Kidd, Paducah, and Dr. C. H. Linn, Kuttawa, Vice-Presidents; Dr. Vernon Blythe, Paducah, Secretary; Dr. J. T. Reddick, Paducah, Treasurer.

The annual session of the Kentucky-Tennessee division of the American College of Surgeons recently met in Lexington. The following officers were elected: Dr. Irvin Abel, President; Dr. B. F. Zimmerman, Secretary; Dr. B. Asman, Councilor, all of Louisville.

Dr. Harry Hazelrigg, Paintsville, has been elected a member of the school board.

(Continued on page 38)

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

APLASTIC ANEMIA, WITH REPORT OF A CASE—DIFFERENTIAL DIAGNOSIS OF THE ANEMIAS DUE TO HEMOLYSIS, AND DUE TO HEMOPOIETIC DEGENERATION*

BY BRYCE W. FONTAINE, M.D.,
Memphis, Tenn.

The subject of this case report was a man 58 years of age, married, a Hebrew, and a salesman by occupation.

He had previously been in good health, but shortly after a heavy financial loss consulted me because of malaise, loss of strength and dyspnea. While he was well-nourished, there was present marked pallor and extreme anxiety on his part concerning his state of health.

He was a middle-aged man, well nourished, but extremely pale. The sclerae were clear. The pupils reacted to light and accommodation. Ophthalmoscopic examination showed punctate hemorrhages in both retinae. The mucous membranes were pale, the tongue was coated, and gums and mucous membrane in the mouth opposite the molars showed signs of recent hemorrhages. The teeth were in good shape, there was no pyorrhea, and the tonsils were not infected or hypertrophied. The lungs were entirely clear and the heart normal to percussion and palpation, but upon auscultation a hemic murmur, systolic in time, could be heard over the pulmonic area. This was not transmitted and was not accompanied with a thrill. The blood pressure was: systolic 140, and diastolic 80. The skin over the chest and arms showed a few small petechiae. The superficial lymph glands could not be palpated. Examination of the abdomen revealed no points of tenderness and no masses. Neither the spleen nor liver could be palpated, nor did percussion show any enlargement of the liver. Examination of the legs failed to reveal any tenderness over the bones or joints. A few petechiae were noted over the shins. The reflexes were active and the patient did not complain of sensory nervous symptoms in the feet or limbs.

Examination of the twenty-four-hour specimen of urine showed the quantity to be 1200 c. c. of pale amber color, acid in reaction, with specific gravity of 1016. There was no sugar, no urobilin; a trace of albumin was present and microscopically a few hyaline and granular casts were seen.

Examination of the gastric contents removed one hour after a Mayo test meal showed 75 c. c., fairly well digested, acid in reaction, with a total acidity of 60, and free hydrochloric acid 45. There was no lactic acid or other organic acids and no occult blood was demonstrable. Starch digestion was delayed. Microscopically numerous starch granules were seen, epithelial cells, muscle fibers, and a slight amount of mucus.

The blood count resulted as follows: erythrocytes, 1,800,000; leucocytes, 3,000; hemoglobin, 28; color index, .8; polymorphonuclear neutrophiles, 17; lymphocytes, 75; large mononuclears, 4; eosinophiles, 2; transitionals, 2; no nucleated erythrocytes; moderate anisocytosis and poikilocytosis; and no polychromasia.

In a study of several smears, no blasts of any type were seen, and while there was a moderate irregularity in the size and shape of the red cells, they did not conform to the megalocytic type of pernicious anemia. There was no basophilic degeneration. Although no total platelet count was made, all of the smears showed the number of platelets greatly below normal. The bleeding time was eighteen minutes.

Studies of the blood by vital-staining methods failed to demonstrate the presence of any skeined or reticulated red cells. The fragility test of the red cells showed a normal resistance to salt solution. Two blood cultures were made under sterile conditions, but no growth was revealed after

*Read in Section on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

seventy-two hours' incubation. The Wassermann test made from the blood serum was negative.

On account of the extreme weakness of the patient, it was not possible to obtain the duodenal contents for study. Because of the inaccessibility to an x-ray machine it was impracticable to make a radiographic study of the case.

The feces contained bile; the benzidin test was positive; urobilin and urobilinogen were not increased to any extent; and microscopical examination did not show parasites or ova.

The course of the case was rapidly downward, weakness becoming so profound that the patient was confined to his bed immediately. Almost from the beginning of the illness, the temperature became elevated to an average of 101.5° in the afternoon. The pulse rate increased correspondingly. Very early in the course of the disease new hemorrhages occurred from the gums and mucous membranes of the mouth; additional petechiae appeared on the body, arms and legs. The patient rapidly lost ground, the anemia becoming more severe. The last blood count showed 750,000 erythrocytes and a hemoglobin reading of 18.

Despite heroic efforts at treatment, in the shape of iron and arsenic by mouth, hypodermically and intravenously, and two transfusions of citrated blood from proven suitable donors, the patient died in a dyspneic attack three weeks from the beginning of his illness. No autopsy was permitted.

The clinical description of this case corresponds very closely to the description of aplastic anemia by Ehrlich in 1888, and to the later case reports of Musser, Hirschfeld, Lavenson, Larrabee, Cabot, Schneider and others. The important points in recognizing the disease are:

(1) Sudden onset and rapidity of course to fatal termination.

(2) Pallor of skin and sclerae, instead of the yellow, waxy appearance common in hemolytic anemias.

(3) Marked leucopenia, with a relative increase of the small lymphocytes.

(4) Reduction in the number of blood platelets.

(5) Hemorrhages from mucous membranes and into the skin.

(6) Absence of splenic and liver enlargement.

(7) No blasts, no polychromasia and no effort toward blood regeneration.

(8) Normal resistance of red cells to salt solution.

(9) No skeined or reticulated red cells after vital-staining.

(10) Normal gastric contents.

(11) No increase of bile pigments in duodenal contents, urine or feces.

(12) Study of bone-marrow, by means of bone puncture, showing marrow hypoplasia.

(13) X-ray examination of abdominal and thoracic viscera negative.

(14) Prolongation of bleeding time.

(15) Absence of retractility of the blood clot.

Aplastic anemia is essentially a rare disease, but confusion could arise in its recognition, and it should be differentiated from pernicious anemia, purpura hemorrhagica, malignant endocarditis, the aleukemic stage of lymphatic leukemia, the hemolytic anemias, cancer of the stomach, and cancer of the cecum.

Even today there are some who believe with Naegeli that aplastic anemia is a variety, or the terminal stage, of pernicious anemia. In aplastic anemia there is never the slightest effort toward blood regeneration as manifested by the presence of blasts of any type stippling of the red cells, polychromasia, and the megalocytic type of blood. The smooth red tongue, so accurately described by Hunter in pernicious anemia, is in marked contrast to the stomatitis and hemorrhagic areas on the tongue and mucous membrane of the mouth, usually seen in aplastic anemia. While in pernicious anemia the blood count may be as low, or even lower than is usually observed in aplastic anemia, the color index is always high. In pernicious anemia the blood platelets are not decreased to any extent; the differential count never shows the marked relative increase of the lymphocytes that occurs in aplastic anemia. The bleeding time in pernicious anemia is normal, but always prolonged in aplastic anemia. The blood clot shows an entire absence of retractility in aplastic anemia as compared with its occurrence to a marked degree in pernicious anemia. Pernicious anemia is rarely so acute as aplastic anemia, and it shows frequent remissions, and early in the course are prominent sensory nervous symptoms. In pernicious anemia the onset is more gradual and the duration of the disease is longer, sometimes running through a course of several years. In aplastic anemia, the course is progressively downward, and no measure is effective in bringing about an improve-

ment in the physical condition or in the appearance of the blood smear.

In my experience, analysis of the gastric contents is one of the most important measures in the differential diagnosis of pernicious anemia. Emphasis was laid upon this feature of the disease years ago by Stockton, and recently the study of Levine and Ladd showed its presence in 99 per cent of their 104 cases. These findings are entirely in accord with my experience and I do not consider the diagnosis of pernicious anemia conclusive, unless the gastric analysis after a test meal has shown a total absence of free hydrochloric acid.

The study of the bile pigment in the urine, feces and duodenal contents, according to the method of Wilbur and Addis and Schneider, will show urobilin, urobilinogen and bilirubin quantitatively increased in pernicious anemia, but normal in aplastic anemia.

The resemblance of aplastic anemia to purpura hemorrhagica is through the occurrence of hemorrhages from the mucous membranes and into the skin, prolonged bleeding time, marked reduction in the number of platelets and an absence of retractility of the blood clot. Even in fatal cases of purpura hemorrhagica, it is rare for the anemia to be so severe, as there is always an effort on the part of the bone marrow to regenerate the red cells, as evidenced by the appearance of poikilocytosis and blasts in the blood, polychromasia and stippling and skeining of the red cells. The white cells usually show a relative polymorphonucleosis. This disease is not so hopelessly progressive as aplastic anemia. It frequently affects the joints and the hemorrhages are more profuse.

It is possible for lymphatic leukemia to present an aleukemic stage in which the lymphocytes are not increased. The resemblance to aplastic anemia consists entirely in the bleeding gums and mucous membrane of the mouth and the relative increase in the lymphocytes. The blood of leukemia usually shows some sign of marrow hyperplasia, polychromasia and stippling of the red cells. There is nearly always enlargement of the superficial and deep lymphatic glands and the spleen.

On account of the fever and the accompanying severe anemia, it might be possible to confuse with aplastic anemia malignant endocarditis. A blood culture properly made will usually reveal the causative organism in the blood stream, leaving no doubt as to the diagnosis. The blood in malignant endocarditis shows some effort at regeneration and usually a leucocytosis, and the anemia is at no time so severe as aplastic anemia. The heart is usually much more disabled than one would expect in an uncomplicated anemia.

The hemolytic anemias are rarely so acute as aplastic anemia, and this is an important point in the differential diagnosis. The recognition of both acquired and congenital types depends upon the presence of more or less jaundice, enlargement of the spleen, a marked lessening of the resistance of the red cells to salt solution, the presence of increased numbers (over 4 to 5 per cent), of reticulated and skeined red cells, shown by the vital-staining method.

It is possible for gastric cancer and cancer of the cecum to produce an anemia so severe as to simulate pernicious anemia and aplastic anemia. This disease may occur without manifest physical signs of cancer, in the shape of pain, tenderness or tumor, in the region of the stomach. It may be entirely overshadowed by the asthenia and anemia. The blood count may be as low as in any case of severe anemia and the smear may be suggestive of pernicious anemia. We should expect the gastric contents to show an achylia, which, of course, would increase the likeness to pernicious anemia. In those cases arising from gastric ulcers, in which the gastric contents still show free hydrochloric acid, there might be some resemblance to aplastic anemia. Usually there are evidences of marrow activity in the blood picture. However, our main reliance would be an x-ray study of the stomach outline and the cecum after a barium meal and an enema for filling defects such as gastric cancer or cancer of the cecum would produce.

SUMMARY

Aplastic anemia, though rare, does occur with sufficient frequency to render

difficult its diagnosis from several commoner diseases of the blood and abdominal viscera. No reliance at all can be placed upon the study of the blood smear alone, for it might resemble any one or several of the severe anemias.

It is possible to differentiate all of the severe anemias: those that are marrow regenerating, those that are non-regenerating, and those that are entirely secondary, as in the cases of cancer of the stomach and cancer of the cecum, by a correlation of all the physical signs, analysis of the gastric contents, quantitative estimation of the bile pigments in the duodenal contents, feces and urine, the bleeding time, the resistance of the red cells to various dilutions of salt solution, the presence of skeined and reticulated cells, when the blood is stained with cresyl blue, the total and differential blood count, hemoglobin reading, the color index, the platelet count, x-ray study of the stomach and cecum for filling defects, study of the bone marrow obtained by bone puncture, and least important of all, the study of the stained blood smear.

1109 Central Bank Building.

DISCUSSION

Dr. C. W. Dowden, Louisville, Ky.—While bone marrow function produces a fairly characteristic blood picture, it does not always reflect the state of the marrow. Depressed or inhibited function may occur as a phase in any anemia and for the time produce the characteristic symptoms and findings of aplastic anemia. True aplastic anemia must, however, in addition to the symptoms, show an actual loss or diminution of the hematopoietic areas in the bone marrow. It would seem, therefore, that accurate diagnosis, in many cases at least, must depend upon the examination of the marrow. Recent work by Falconer and Morris, following the studies of Ghedini, show that study of the bone marrow during life is quite feasible and comparatively simple as a diagnostic procedure. Puncture of the tibia, femur or ribs is done, and enough marrow aspirated to make a microscopic study.

This work has brought to light many peculiarities as to the state of the marrow when compared with the clinical course and blood findings. They have cited instances in which the clinical course was typical as was also the blood picture, with the marrow showing the characteristic fatty changes with no areas of regenerative tissue. But in seven weeks after transfusion a normal blood picture was exhibited with hemoglobin of 62 per cent, white cells 11,500, neutrophiles 60 per cent, lymphocytes 29 per cent, and with poikilocytosis, macrocytosis, and reticulated red cells. Later the case relapsed and died of progressive anemia with purpura and marrow aplasia. There was another case typical as to symptoms and blood picture, with repeated hemorrhages uninfluenced by transfusions, and the blood showing no signs of regenerative properties, yet the marrow from the rib and the femur was not aplastic and showed regenerative areas. They believed that death was due to idiopathic purpura hemorrhagica, which was so rapid in its course that the marrow had no opportunity to respond.

That two types of anemia may exist in the same individual, presenting the characteristics of both, would seem probable from the report of Archibald, with onset, course, temperature, hemorrhage, gastric secretion, absence of nervous symptoms and remissions, as well as 1800 neutrophiles and 85 per cent lymphocytes showing 46 normoblasts with anisocytosis, poikilocytosis, polychromasia, and a lemon yellow color and sore mouth. Post mortem examination showed complete fatty replacement of the marrow of long bones and hyperplasia of the marrow of the sternum and ribs, and normoblasts and megaloblasts with mitosis, in abundance. The gastric analysis showed normal acidity and the final diagnosis was aplastic anemia. It would seem, therefore, that while the history, clinical course and blood findings will usually establish the diagnosis, not infrequently it is impossible. At a given moment blood findings that are identical may be present in several of the anemias. Intermediate cases between the extremes must be present and confusing.

The secondary type of aplastic anemia which presents much the same type of picture is recognized in poisoning from benzol, bacterial toxins, roentgen ray and radium, and probably other causes. These, of course, are modified by the primary disease and are not to be confused with the idiopathic type from which recoveries do not occur.

The so-called myelophthisic anemia in which tumors crowd out the normal hematopoietic structures, the secondary aplastic anemias, idiopathic purpura hemorrhagica, and the aleukemic phase of lymphatic leukemia, at some phase of their development probably present findings distinctly similar to idiopathic aplastic anemia and the etiology must be carefully searched for and uncovered. Therefore it would seem that we are not in a position either from the bone marrow study or from the symptoms and blood picture to say what takes place from the beginning to the end so far as the marrow changes are concerned and what is productive of the symptoms that follow. It is quite possible for us to conceive that if the hypothetical poison is intensive enough complete cessation of bone marrow function will follow, producing so-called aplastic anemia. When this poison is less intensive we may have varying degrees of bone marrow activity, producing various types of anemia.

Since the differentiation between certain forms of idiopathic purpura hemorrhagica, particu-

larly, and idiopathic aplastic anemia is difficult or impossible, and since considerable diagnostic ability is necessary to differentiate the primary from the secondary aplastic anemias, some caution should be displayed in giving an absolutely unfavorable prognosis. We feel that we are not at this time quite prepared to say that aplastic anemia is an entity, although we have no definite proof for such a statement.

Dr. William Litterer, Nashville, Tenn.—The etiology of aplastic anemia is quite obscure. Experimentally it can be produced by various chemicals such as the coal tar derivatives, high explosives, benzol, etc., and also in cases of severe sepsis. It is evidently a condition in which the blood-forming organs have received a severe shock on the one hand, while on the other there is a poisoning of some sort which causes these organs to strike.

Within the last few months we have seen a number of cases of this condition. It would seem that these cases come in groups very much as a surgeon will see quite a number of cases of appendicitis or other conditions coming in groups. At the Protestant Hospital, Nashville, my brother, Dr. J. H. Litterer, the Pathologist there, made autopsies on four cases of aplastic anemia within the past four months. All of these cases gave the identical picture as outlined by Dr. Fontaine. The bone marrow of flat bones and the heads of long bones was yellow and gelatinous in consistency. The gastric contents were nearly normal, which, I think, is a very good diagnostic symptom between aplastic anemia and pernicious anemia. I saw a case about six months ago in which a physician had given arsphenamin, thinking he was giving neo-arsphenamin. Six-tenths of the arsphenamin was given in ten cubic centimeters of distilled water without neutralization instead of in three or four hundred cubic centimeters. The injection was given intravenously. The shock was great at the time and produced unconsciousness for several hours. However, the patient finally survived the immediate injection and was able to get about the next day. He never quite regained his former strength, felt badly, and was sallow in color. I saw the case two months after the injection of arsphenamin. No blood examination had previously been made. His last illness came on acutely and prostration was the chief symptom at first, followed later by hemorrhages in different parts of the body. The blood examination showed the red blood cells about 1,200,000 and hemoglobin 25 per cent. The red cells were practically normal in contour, size and shape, but low in color. There were no normoblasts or megaloblasts. The platelets were absent. The leucocytes ran up to 75 per cent of the small type lymphocytes and about 10 per cent large. There were very few polymorphonuclears, eosinophiles and mast cells. The patient had hemorrhages and autopsy showed an aplastic condition of the bone marrow. The case was typical of aplastic anemia and probably the initial condition may have been due to the giving of arsphenamin.

About two years ago I saw a case of pernicious anemia which was typical in every way, characterized by remissions. It had typical megaloblasts, normoblasts, poikilocytosis, high color index, and everything that goes with pernicious anemia. In the last month of his illness the blood changed so that there were no blast cells left, no reticulated cells present, and the red blood cells were practically normal except that they were somewhat out of shape. In other words, the case presented a typical picture of aplastic anemia. Hemorrhages occurred and autopsy showed aplasia of the red bone marrow.

Dr. Randolph Lyons, New Orleans, La.—I have seen many cases of pernicious anemia, a few cases of purpura hemorrhagica, and anemias of other types secondary to septic poisoning, but I have never seen one that I was able to say definitely was an aplastic anemia of the idiopathic type.

In the literature there has been considerable discussion as to whether aplastic anemia was a distinct entity. At one time it was considered to be related to pernicious anemia. More recently I think the tendency is to consider it in relation to purpura hemorrhagica, for these two conditions have many points in common, hemorrhages, the bleeding time, lack of platelets and the fact that the coagulation time is not affected.

Dr. Tom A. Williams, Washington, D. C.—Very little mention has been made of an extremely important factor in the differential diagnosis of pernicious anemia. I have no experience with aplastic anemias, but I can say that in no case I have seen of pernicious anemia has there been an absence of very distinct neurologic signs. Furthermore, in a considerable number of patients there have been neurologic signs present for some time where the blood picture has been reported as completely negative; no poikilocytosis, no megaloblasts, and not even an indication of crenation of red deposits. That has occurred repeatedly in patients in whom a diagnosis of pernicious anemia has been made by myself on the neurologic signs alone. In all these cases the patient has gone on to present later a complete picture of pernicious anemia, followed by ultimate death. Frequently, in cases which are observed by internists, there is an inadequate neurologic study of the patient because the neurologic signs need not necessarily stare one in the face. There need not be any change in the deep knee reflexes. In all cases that I have seen there has been a loss of sense of attitude in the toes and the subjective sign of tingling extremities has been reported by the patient as having occurred several months or years before they came for consultation. The sign of lost or diminished sense of attitude in the toes cannot be elicited without the proper technic, and not by a mere moving up and down the toes, and asking the patient. When the test is made in a

careless manner, it is not to be wondered at that the sign may be overlooked. A normal person can always tell approximately the exact position of any of his toes or fingers, and if he cannot do so, there is something wrong, and usually that something wrong is a neurologic lesion. We know there are lesions in the spinal cord in these cases, and I suppose that in most, if not all cases, we can infer that the neurologic signs are a part of the disease and not merely a by-phenomenon. They are just as much a sign of pernicious anemia as the blood picture and are both due to the same cause.

Dr. Sydney R. Miller, Baltimore, Md.—Aplastic anemia is not infrequent in patients undergoing intensive arsphenamin therapy. Dr. Keidel has recently reported a series of six or eight such cases, and I have seen two. This, of course, suggests the importance of periodic blood studies on cases receiving this form of specific treatment. Second, there are cases of apparent aplastic anemia which recover. The analogy is similar to cases of acute infectious mononucleosis, closely simulating acute leukemia, but going on to recovery. Though true aplastic anemia seems almost always rapidly and progressively fatal, there yet remains a feeble ray of hope encouraging one to battle on relentlessly. Finally, it must ever be remembered that radium is capable of inducing bone marrow aplasia. Physicians or technicians using this, as well as patients subjected to radium emanations, must be protected from this danger by careful and frequent blood studies.

Dr. Fontaine (closing).—The case to which Dr. Dowden referred was clearly pernicious anemia because of the fact that the patient showed signs of blood regeneration and showed no definite evidence of jaundice. It might have been one of pernicious anemia which was approaching the terminal stage of aplastic anemia. Cases have been reported which have developed every appearance of aplastic anemia, but were cases of true pernicious anemia in the beginning. If there is any relation between the two conditions, this was a case of that sort.

I was much interested in what Dr. Miller said about arsphenamin. I have not seen a case of that sort. We should be careful about the injudicious use of this drug.

Aplastic anemia has been produced in some x-ray workers by improper protection of themselves, and there is a report of a prominent English radiologist who developed anemia first corresponding to the type of pernicious anemia, and finally wound up with an anemia that corresponded in every detail to aplastic anemia and died from that disease.

In our locality the disease is rare. I have never had a case before. Cases have occurred in our Municipal Hospital. My colleague (Dr. McElroy) had a case autopsied before this case was reported in which there was typical marrow hypoplasia and every other symptom corresponded closely to this case.

PARAMYOCLONUS MULTIPLEX EPILEPTICUS*

By Newdigate M. Owensby, M.D.,
Atlanta, Ga.

The history of paramyoclonus multiplex epilepticus began in 1881 with a description of a case by Freidreich. During the ten years that followed several cases which more or less resembled his were put on record, and in 1891 Unverricht added a family form associated with epilepsy.

Though Freidreich's disease adheres more closely to the term paramyoclonus multiplex epilepticus, it falls short of being the actual disease covered by this title, as it is not associated with epilepsy. Therefore, whenever epilepsy is present the term myoclonus-epilepsy or Unverricht's disease would be of value in the differentiation of the two diseases and should be employed.

Despite the fact that Unverricht was the first to call the attention of the medical profession to the association of epilepsy with paramyoclonus, it is interesting to note that a very good description of the symptoms is to be found in a novel, published in Paris before 1873, "In Peril of His Life," by Emile Gaboriau. Other cases which have a strong resemblance to myoclonus-epilepsy were described by Prichard (1832), Herpin (1852), Delasiauve (1858), and Hammond (1867).

Since the publication of Unverricht's description of myoclonus-epilepsy, probably not more than 120 cases have been reported, the majority of which have appeared in German, French and Italian literature. Because of this fact I shall summarize the history of a case closely resembling this condition which has recently come under the observation of the Neurological Department of Grady Hospital. The history was obtained from the patient and because of a certain amount of mental deterioration being present, many of the essential points could not be obtained.

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*Read in Section on Neurology and Psychiatry, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Of his family history he knew very little other than the fact that his father died at the age of thirty-five from typhoid fever; that his mother was living and in poor health because of some kidney trouble; that he had eight brothers and sisters living, who are healthy; and that three brothers and sisters died during infancy of unknown causes.

As to his past life he stated that he was the third born and thinks that he was a healthy child until his eighteenth month. At that time he had an attack of cerebro-spinal meningitis and for a period of twelve months he was in a semi-conscious state and completely paralyzed. At the expiration of twelve months he became conscious and within the next year gradually regained the use of the muscles of the upper extremity. He was unable to walk alone until his eighth year and then only with the aid of a cane and ankle supports. When he was sixteen years of age he contracted typhoid fever and a very slow recovery ensued. The two years following this illness he was affected with dizzy spells which closely resembled petit mal. In the summer of 1921 some financial and domestic difficulties arose which gave him much concern. These continued and he grew more and more nervous until the day before Christmas of that year, when he noted myoclonic muscular convulsions in various parts of his body. Slight giddy spells returned and late in the evening he had a general convulsive seizure which had all the indications of being a grand mal attack. After the passing of this convulsive seizure he became comatose for a period of ten hours, which was in turn followed by a period of excitement of several days' duration.

The myoclonic muscular convulsions continued since that time. They occurred at irregular intervals and varied from a few minutes to an hour in duration. No particular muscle or group of muscles were free from the seizures, except those of the lower extremities, and they had never been affected. There was no return of the epileptiform convulsion.

Physical examination showed a marked atrophy of all the muscles of the thighs and legs. The knee jerks were markedly exaggerated. In all other respects the physical examination was negative. The neuropsychiatrical examination revealed a slowly progressive mental enfeeblement.

Luminal and sodium bromid were administered and controlled the myoclonic muscular convulsions for as long as two weeks at a time.

It is the opinion of the various writers that in the development of this so-called association disease, epilepsy occurs first in one half of the cases by periods ranging from a few weeks to several years. In one-third, myoclonus appears first, and in the remainder the diseases have a simultaneous onset. The epileptic attacks are usually nocturnal at first; later they may become diurnal. As a rule the epilepsy continues throughout life, but in a few instances it exists only at the beginning of the disease. The seizures are never preceded by a sensory aura, but premonitory signs of increased myoclonic contractions are in evidence in the great majority of cases, although seizures may not always occur at their climax. The muscles most frequently involved in the epileptic seizures are those most commonly engaged in the myoclonic contractions. The sufferer is less commonly free from myoclonus than from epilepsy. In many cases consciousness is only disordered or partially lost. Melancholic-mania is fairly frequent in myoclonus-epilepsy, especially after a series of bad days.

In myoclonus-epileptics the clonic contractions of myoclonus end imperceptibly in the tonic stage of the epileptic paroxysm. The contractions are often strong and affect large masses of muscles; consequently locomotive effect is common. The trunk is very frequently affected, causing the patient to jerk the body with suddenness and violence. The face and fingers and toes are often involved. As a rule both sides of the body are affected alike. Usually the myoclonus begins in the muscles of one or both upper extremities, and in less than three months involves, in the order named, the lower extremities, chest, abdomen, neck and face. Some days the contractions are milder, some days are more severe, than others. These constitute the good and bad days. As the disease progresses the myoclonus becomes more persistent during the waking hours, and the patient may finally die of exhaustion. However, long intervals of quiet may be obtained by the use of sedatives.

Usually the people afflicted with myoclonus-epilepsy are not well developed physically and mentally. They are of dwarfed stature and their bones and muscles are not developed. Because of the difficulty in swallowing there is usually a general lack of nutrition. They are anemic and easily contract other diseases. Their mental state varies from slight mental feebleness to complete imbecility or idiocy. As for the prognosis of these cases, they may linger for a long time, but there are no actual cures on record.

So far only theories have been advanced as to the pathology of this disease. Various authors have advanced their hypotheses, but nothing absolutely definite can be asserted. Unverricht believes that the disease is due to excitation of the motor ganglia of the cord, a hypothesis essentially identical with that held by Friedreich in his original thesis on myoclonus. To account for the association disease, Unverricht assumed an additional implication of the cortical motor ganglia to explain the epileptic phenomena. Later theories have successively ascribed the myoclonic lesion to the medulla, cerebellum, corpus striatum, optic thalamus and to morbid conditions in the cerebral cortex.

Koshewnikow regarded his cases as due to circumscribed encephalitis with termination in sclerosis, meningeal adhesions, etc. Bottiger believes in its cerebral origin because of the epileptic feature and the presence of isolated muscular contractions, as in paresis and various forms of meningitis, known to involve the cortex. Krewer agrees with Minkowski and Grawitz in placing the lesion in the cortex, the process beginning as a cortical irritation and extending by continuity to ganglionic cells which preside over individual muscles. If the disease were of spinal origin, there should be trophic changes in the muscles. Murri once found lesions of the Rolandic region in a case of essential myoclonus and believes that the lesion of myoclonus-epilepsy is also cortical. Raymond, Rabot, Garnier and Santenoise, Dide, Verga and Gonzales, and Clark and Prout all have expressed similar opinions as to its cortical origin.

In conclusion it may be said that the lesion of myoclonus-epilepsy appears to be in the cerebral cortex involving the nucleus and intranuclear network of cells of both sensory and motor types. Its pathogenesis appears to be an intoxication of these cortical cells, probably brought about by a faulty chemotaxis of these same cells because of an inherent organic anomaly. While each condition maintains its separate morbid entity, the two are closely allied and indeed are often found as indissolubly associated clinically and pathologically as are the motor and sensory functions of the cells they involve.

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DISCUSSION

Dr. Beverley R. Tucker, Richmond, Va.—I agree with Dr. Owensby in the conclusion that the convulsions are due to some kind of irritability of the cerebral cortex. But we see paramyoclonus multiplex epilepticus in conditions that are congenital and we see paramyoclonus in other conditions in which there is no epilepsy. That brings me to the conclusion that possibly the convulsions are incidental and that in those cases in which there is cortical injury, convulsions occur; but the convulsions themselves are sometimes of the paramyoclonus type rather than that paramyoclonus multiplex plus epilepticus is a true entity.

We see the paramyoclonus symptom in brain tumors. I can recall one or two cases that were very marked. We also see it functionally, and I recall one case with a very marked myoclonus in a young woman who was assaulted near Richmond and who escaped from the man who assaulted her, and got hold of a pistol and attempted to kill herself. Fortunately the woman escaped a skull injury, but was brought home in a bad nervous condition, was put to bed, and myoclonus started up. She was relieved with a few weeks' rest and suggestion.

Possibly some of you gentlemen may remember Dr. Buffalo, of Jacksonville, who had an interesting case of myoclonus of the right leg, which followed a slight attack of fright while he was recovering from an attack of infantile paralysis. He had infantile paralysis when young, which at first involved all extremities. Everything cleared up except the right leg. He had atrophy in this right leg with absence of the reflexes, and all of his life after that he had myoclonus. Sometimes it was very slight. It would hardly show itself for months and months, and then would become so severe that it would interfere with his work. Rest always helped it.

The point I want to make is whether we should include in the syndrome the epileptic part, or whether that may not be simply a symptom at times of paramyoclonus multiplex.

TROPICAL SPRUE AND ITS RELATIONSHIP TO DISTURBANCES OF PANCREATIC DIGESTION*†

By Daniel N. Silverman, M.D.,
and
Willy Denis, Ph.D.,
New Orleans, La.

The more frequent occurrence of sporadic cases of tropical sprue and the alertness on the part of the profession, especially of the South, to recognize this condition is evidenced by the recent communications of Wood, Brown, Simon and others. Certain of these authors have reported individual cases, giving descriptions of the various clinical manifestations. Others have laid special stress on the most important findings in the pathological changes wrought by this disease. Wood, for instance, has spoken clearly on the blood findings and states that in the recognition of tropical sprue a close study of the blood picture is of greatest interest. The close resemblance of the changes in this disease to those found in cases of pernicious anemia often necessitates a closer study for differential diagnosis. It is maintained by some that a possible relationship exists between the two conditions in question. At the present writing this remains unproven.

Aside from the blood picture, sprue is characterized by a group of symptoms resulting from a chronic catarrhal inflammation of the entire gastrointestinal tract. A sore tongue and sore mouth are among the initial and most persistent lesions.

There are disturbances of liver function and improper pancreatic digestion. The latter condition clearly manifests itself by the invariable finding of voluminous, light-colored or white stools containing an abundance of undigested fat. Notwithstanding this fact, little attention has been given to the actual pathology of the pancreas in sprue. Therefore, there remain numerous and uncertain opinions regarding the structural alterations of this gland. In speaking generally on the pathology of sprue, Simon does not believe that the pancreas is involved in typical cases. Michel states that the gland may be small, pale and diminished in size, but finds that its structure histologically is normal with the slight exception that in parts of the organ some of the acini are congested. He believes that the secretory function of the pancreas becomes disturbed in 60 per cent of the cases as a result of invasion of the pancreatic duct. Ashford expresses the probability that pancreatitis does exist in a certain number of cases of sprue, but that the real condition is atrophy and altered function of the gland. Some few years ago, Castellani and Chambers held that the pancreas may be normal, inflamed or cirrhotic.

The first attempt at investigating the external function of the gland, in an effort to determine its possible deviation from the normal, was made by Brown in 1916. He examined the stools for the pancreatic ferments and reported an absence of all three, trypsin, lipase, and diastase. The same author, in a more recent report, analyzed the quantitative pancreatic ferments by careful study of the stools in five atypical cases of sprue. In three of his cases, the duodenal contents were also tested after removal with the Einhorn bucket. Whereas no conclusive results are given for the duodenal contents, the quantitative findings of the ferments in the stools were the result of repeated and uniform tests. Determinations were made once in one case, twice in three cases, and five times in one case. Brown's cases were of long duration, the shortest period being one year, in one case. This author does not draw any general conclusions, but feels that in certain of the chronic cases of sprue there is practically complete absence of the pancreatic ferments. Incidentally, it may here be mentioned that he therefore advocates the regular and constant administration of pancreatin in addition to the other forms of treatment, reporting some apparent clinical cures in this way.

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†Read before Southern Gastro-Enterological Association, meeting conjointly with the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

As to the immediate cause of these alterations in activity of the enzymes, it must now be recognized that this becomes a somewhat speculative factor in each individual case. While these disturbances may be due to a true pancreatitis or some degeneration of the glandular tissue, as has been described under the pathology of the disease by some, our observations in a large series of other types of cases have led us to believe that partial or complete inactivity of the enzymes in the duodenal contents can very well be associated with functional inhibition of the pancreas.

In this communication we desire to relate the findings of the enzymatic activity of the duodenal contents in a typical case of sprue before and during clinical improvement. Contents are always obtained under the condition of fluoroscopic visualization of the duodenal tube in the second portion of the duodenum and are analyzed by the method of McClure, Wetmore and Reynolds. Stockton thinks that this method places the testing of the enzymes on a standardized basis. Franklin White has stated that this method will give us constant quantitative results in ferment estimation which is not true of other methods. These statements are in accord with our belief after employing the McClure technic in a series of eighty examinations.

On the other hand, we would discourage attempts at testing the stools for the ferments, since this means of analysis is only approximate, cumbersome and inaccurate in the light of our present knowledge. Along this line, Strauss recently compared the values obtained by examination of the feces and of the duodenal fluids. In fifty-nine comparative tests for trypsin only five gave uniform results for stools and for duodenal fluids in one-hour tests. In the 24-hour test the results coincided approximately in 46 feces and duodenal juices. In 13 they differed. The duodenal values were more constant. Thirty-two of the 59 gave approximately uniform results for diastase. In ten cases higher ferment content values were obtained for the feces than for the duodenal fluid. The tests for lipase were constant for the duodenal contents. Lipase was not demonstrable in the feces. This writer very justly concludes that the examination of the feces gives unreliable results and may lead to errors in the diagnoses of pancreatic disease. The duodenal fluid gives conclusive results for trypsin and lipase. For diastase, the results are indefinite, but duodenal contents are at least more reliable in this respect than examination of the feces.

Isaac-Krieger maintains that examination of the duodenal fluid for ferments offers fewer opportunities for error than does examination of the feces, and that it is to be preferred to the latter method. This author contends, however, that the examination of the feces for diastase is of value as an accessory procedure.

CASE REPORT

A white male, age 44, in the employ of the United States Veterans' Bureau as an auditor, was first seen on March 23, 1922. He complained of an annoying diarrhea, an irritated mouth and a gradual decline in his health. These symptoms had endured to a greater or less degree for the preceding three years. At the onset he was compelled to leave the Philippines, where he had been in the Government service for seven years. Along with him, and because of a diarrhal condition, a friend also returned from the Islands to the United States. This individual soon died with a diagnosis of tropical sprue in the Johns Hopkins Hospital.

Our patient had gradually and steadily lost fifty pounds in weight. For short periods, varying from a few weeks to two months, the sore mouth would become much less irritating and the diarrhea would abate. During the time of his illness his mouth was always too sensitive to stand smoke which he had formerly accustomed himself to by smoking forty to fifty cigarettes daily. His bowels would move four or five times in the morning after breakfast. He noticed that the stools were very copious, light of color, and contained much gas. There were no abdominal pains and the stools were always free from blood and pus.

Previous to the onset of this illness, he had enjoyed very good health. Twenty years before, he contracted a venereal sore, but did not notice any other symptoms. Without further investigation, a diagnosis of syphilis was made and treatment was instituted accordingly. There were no other serious illnesses that he could recall. Among some of his previous examinations were three blood Wassermann tests which were negative.

His family history was negative with the exception that his only child died from an unknown cause one month after birth. His wife had had no miscarriages.

Physical examination showed a well developed but poorly nourished man weighing 126 pounds. General inspection immediately revealed a much distended and protruding abdomen. The skin was stretched in this region.

The external appearance of the head and scalp was normal. His pupils reacted to light and accommodation. There were many superficial ulcers of the buccal mucous membrane and along the margin of the tongue which was pale, smooth and clean on the dorsal surface. The teeth and throat were in good condition. The skin was moist and not discolored. There were no palpable lymph glands.

The thyroid was apparently not enlarged.

Heart and lungs were negative.

Percussion of the abdomen proved the distention to be due to gas. There was no sensitiveness on palpation.

The liver was not enlarged upward and its free edge was not palpable.

The external genitals showed no evidence of a previous lesion. There was no undue sensitiveness on pressure along the sternum, tibia and other long bones.

Knee reflexes were present.

Rhomberg, Babinski and ankle clonus were not present.

Urinalyses were negative.

The stool was very voluminous, measuring ¾ pint, practically colorless, only tinged with yellow, and semi-solid, containing quantities of gas. Upon standing, the portion of the stool exposed to the air assumed a dark gray color and after twenty-four hours there was a distinct layer of this dark material. Microscopically, there were numerous free fat globules and fatty acid crystals in each field. Repeated examinations confirmed the findings in the first specimen.

Proctoscopic examination revealed a dry rectal mucosa with a single small area of denudation, bleeding slightly.

The blood picture showed a mild degree of secondary anemia with a hemoglobin of 70 per cent.

The blood Wassermann reaction was negative.

Gastric analysis showed a normal quantity of acidity with a H-ion concentration of 1.8. The gastric mucus was in great excess and the quantity resembled that found in old cases of gastritis.

The fasting duodenal contents had a H-ion concentration of 7.2. The microscopic examination was negative.

The enzymatic activities were as follows:

(1) Lipolytic activity 0.5 c. c. (Expressed in c. c. N/10 NAOH.)

(2) Amylolytic activity 0.6 mg. (Expressed in mg. of glucose.)

(3) Proteolytic activity 0.9 mg. (Expressed in mg. non-protein nitrogen.)

This patient was immediately placed on a meat and milk diet, which consisted of one-fourth pound of lean steak and two quarts of whole milk. Medication with pancreatin, as suggested by Brown, was given in 10-grain doses with calcium lactate one hour before meals three times daily. There was an immediate improvement in the mouth lesions which subsided entirely in five days and he was able to resume smoking. The stools became formed, solid and contained no gas, numbering one or two per day. Their color remained the same. Microscopically, all specimens failed to show any free fat or fatty acid crystals. A loss of six pounds in the first week and an increase in the daily diet to two and three-fourths quarts of milk with one-half pound of lean meat was followed by a greater loss in weight of one and one-half pounds in the following week. At this stage of the treatment he weighed 118½ pounds. He could not have the benefit of absolute rest in bed on account of his clerical duties. At the beginning of the third week, Lister flour muffins was added to a daily diet of three quarts of milk and one pound of meat. His weight steadily increased until there was a gain of seventeen pounds within two months. For the first time, his stool was then cultured for the monilium psilosis, which could not be recognized.

On May 30, 1922, the duodenal contents were reexamined for the respective ferments under the same control conditions as previously and were found to correspond with the average normal case in our series. The quantitative enzymes were:

Lipolytic activity, 2.7 c. c.

Proteolytic activity, 1.3 mg.

Amylolytic activity, 1.6 mg.

The amount of lipase found in this analysis represents approximately five times its strength in the first examination, whereas the amylase and protease have each doubled their respective activities.

SUMMARY

The results of our observations in this case do not warrant any general conclusions. We have shown that the enzymes of duodenal contents in a case of sprue were present to a considerable extent during the clinical course of the disease, and that these enzymes greatly increased in strength, even up to normal amounts, during clinical improvement of the case. These facts would lead us to believe that in tropical sprue the pancreas does not always undergo extensive or permanent damage and that this gland may assume its normal digestive function.

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DISCUSSION

Dr. John L. Jelks, Memphis, Tenn.—Sprue has not been studied in this Country as it would have been if it were as prevalent as in foreign countries.

In connection with this subject I wish to refer to Aldo Castellani (*British Medical Journal*, May 5, 1921), who advises large doses of soda bicarbonate. As tropical sprue is often complicated with ameba infection, 6 to 12 injections of emetin are given, and large doses of soda given three times a day. Papain, taka-diastase and pancreatin are given. These do very little good in the early stages, but later pancreatin especially is emphasized as of value by Brown. When diarrhea is very severe, 5 to 10 grains of salol and bile salt are given. I should like to know why emetin is indicated.

Mr. Edward J. Wood says that the literature overemphasizes the tongue symptoms, which in a large proportion of cases under his observations are quite secondary to intestinal and blood symptoms.

Mayo Robson, in 1907, reported finding chronic inflammatory changes in the pancreas and some were complicated by pancreatitis. Autopsy shows atrophy of the pancreas.

The post mortem observations of Sidney Simon as to the pathology found in the intestinal tract are quite interesting and are identical with those I have found in the intestines of pellagrins, so that I have wondered if he may not have made an error in diagnosis.

Dr. Sidney K. Simon, New Orleans, La.—The role that the pancreas plays in the etiology of sprue has long been a subject of controversy. My own observations have led me to agree with Drs. Silverman and Denis that the pancreas is not a direct causative factor in the disease. Fat stools are found under many and varied conditions. In sprue, the increased fat content of the feces is most probably connected with an insufficiency of fat absorption rather than a pancreatic achylia. The tests for the pancreatic ferments in Dr. Silverman's case were conducted with scientific accuracy and each of the enzymes were found to be present in normal amounts in spite of the persistent fat diarrhea. I am inclined to believe that some of the cases reported in the recent literature have not always been instances of true tropical sprue.

To my mind, sprue is a metabolic disease, somewhat parallel to, but independent of, pellagra. As in the latter disease, there may be a combination of the metabolic factor with some as yet undetermined specific organism. Up to the present time, Ashford and Michels' observations on the etiologic importance of the monilia psilosis in sprue have not been confirmed.

Dr. J. E. Knighton, Shreveport, La.—I should like to ask Dr. Silverman whether most of the cases that have come under his observation have developed in this Country. Very often the cases seen in this Country are imported. The question arises, are we likely to find cases developing in our Country as a result of those that are imported?

Dr. A. W. Calloway, Asheville, N. C.—Ashworth and Michel have done excellent experimental work in Porto Rico, having described the changes found in this condition. Their studies have been kept up in accordance with scientific methods and their conclusions are that a yeast fungus is the origin of the disease. They have proven apparently to their own satisfaction that the administration of specific vaccines will prevent the disease, but these specific vaccines have not appealed to other authorities. Because of the fact that practically all pathologic states are prone to produce fatty fermentation of the stools, the inference has been that tropical sprue is but another example of pathology of the pancreas.

The post mortem findings, however, in typical cases of sprue have not indicated such an origin. I agree with Dr. Silverman that the quantitative analysis of pancreatic enzymes in the stool is on a very firm foundation, but the pancreatic secretion through the development of the tube method is on a much firmer and surer foundation than the other method of examination of the stool.

Sprue may be due to some metabolic disturbance. The mouth symptoms, leaning toward an acid condition of the saliva in sprue, follow closely upon the theory of Dr. Smith expressed this morning.

A recent announcement by Castellani that he had obtained therapeutic results in cases of sprue from large doses of bicarbonate of soda is worthy of notice.

As to therapy, as I remember now, I have seen five or six cases of sprue that have been materially improved by high protein diets in which the fats and carbohydrates have been excluded. No treatment is successful without a high protein diet, and you may eventually add small amounts of carbohydrates to the diet. But the fundamental plan of dietetic therapy must exclude all carbohydrates and fats.

I am more and more convinced, as I contemplate the etiology of sprue, of the close connection of such a disease with other well-known metabolic conditions, such as pellagra.

Dr. J. F. Yarbrough, Columbia, Ala.—I think Dr. Simon hit the keynote when he said that sprue was a metabolic condition. It is a disturbance of metabolism and we have the same abdominal symptoms, the same mouth, the same throat, the same gastrointestinal disturbance, the same mental derangement that we have in pellagra.

Under a strict protein diet and alkalinity, these cases of sprue recover.

As Dr. Smith suggested this morning, sprue, pellagra, and many other allied conditions are simply the result of carbohydrate intoxication.

Dr. Silverman (closing).—Pellagra is one of the diseases sometimes confused with sprue. Wood, with a very broad experience, sees no resemblance between the two conditions. The stool in sprue is very voluminous because of the great excess of calcium salts, practically white, and it contains much undigested fat. Such evidences of pancreatic disturbance are not encountered in pellagra. The diarrhea accompanying the latter is very often bloody and mucoid as a result of extensive ulceration.

I have not had a case which developed in this Country. However, Wood reports such cases from the Carolinas. Other cases have been reported as developing in Massachusetts. Like our own, Brown's cases were all foreign—3 from Porto Rico and 2 from the Philippines.

Starches are not tolerated by these patients. They soon learn to avoid them because of the distress encountered. We were able by the administration of milk and meat to get in 140 grams of fat and considerable protein every twenty-four hours.

TREATMENT OF LEPROSY*

By R. M. Wilson, M.D.,
Southern Presbyterian Mission Hospital,
Kwangju, Korea.

While this paper is primarily for consideration of the treatment of leprosy, I shall mention the various ideas of its cause.

The lepra bacillus was discovered in 1872 by Hansen, and in many ways has very much the appearance of the tuberculosis bacillus, being also acid-fast. The lepra bacillus is resistant to any culture medium so far tried. While some claim that the bacillus can be found in 95 per cent of scrapings from the mucous membrane of the nose in lepers, we have been able to find it in hardly 75 per cent. The swollen glands and ulcers are teeming with the bacilli and they can usually be found along the sheath of the ulna and perineal nerves.

SPREAD

Just how the disease is carried is still a problem to be worked out. Most of the best authorities are opposed to the idea that it is transmitted by the mosquito or other insects. However, when fed upon leprous secretions rich in the parasites, the bacilli have been found in the stomachs of these insects. It has been my idea for some years that the disease is probably transmitted by the itch mite, as the lepers usually are from the poorer classes, and unclean in habits. Most of them have scabies and here we have a portal of entry where the bacillus can be sealed up in the skin and make its growth at some later period when the proper conditions are ripe or the resistance low. The incubation period seems to vary from three months to about twelve years.

There is a native belief that leprosy is a curse from Heaven and that the only cure for this dreaded malady is to partake of human flesh. The testes are considered to possess the essential extract; and occasionally a baby's life is taken and this part eaten in the effort to find a remedy. Two men were arrested in our city for such a crime, and the police tell me that this occasionally happens.

TREATMENT

In 1908, I first used chaulmoogra oil by mouth and found that more than half the cases became so nauseated that it was difficult to continue the treatment. Many of them continued it, however, and held the disease in check in that way. In 1913, we began the injection of the oil subcutaneously and have continued to the present with very encouraging results. The oil as found in the markets is boiled and gum camphor added to make 1 per cent of camphor. This is injected into the buttocks weekly, starting with 3 c. c. and working gradually up to 7 or 8 c. c., according to the endurance of the individual. The treatments are given on Saturday, all rest over until Monday morning, and there is very little complaint of pain or interference with work. Occasionally we get an abscess, which is due to improper technic. Our lepers have been trained to give treatment themselves and this might happen occasionally in their hands. We feel that we get recovery in about 8 or 10 per cent of the cases coming in early stages of the disease, and the disease arrested and held in check in probably 60 per cent. As many of the cases have tuberculo-

*Read in Section on Dermatology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

sis, lues and other complications, one could hardly expect improvement in all cases.

Our cases are divided into three classes: (1) those taking the oil and camphor; (2) those taking the ethyl esters as made by the Rockefeller Foundation; and (3) the ethyl esters made by Dr. Shega, of the Japanese Government in Seoul.

New cases show marked improvement with either of these methods, but our best results have been gotten from the chaulmoogra oil and camphor. In the chaulmoogra oil we have not only the ethyl esters, but other properties of the oil, and we feel that our best results are obtained from the oil itself. For about two years we used sodium gynocardate as made by Rogers, in Calcutta, but with no appreciably results.

General hygienic care, baths, tonic and proper diets are very essential in the treatment. Many lepers come to us very weak and run down and in miserable physical condition, and after a few months' care and treatment they regain their strength and are able to carry on heavy manual labor. We require that every leper who is physically able must take some part in the work and care of the institution, even if it is no more than digging in the garden.

We have been able to train our lepers for various industrial lines of work such as carpentry, masonry, brick and tile making, weaving, farming and other industrial lines; and these activities are important in the treatment for giving the proper exercise, limbering up the stiffened or contracted joints and muscles, stimulating better appetite, and helping to make them forget and cease brooding over their condition. We consider these activities a very important part in the treatment.

After having been on the injection treatment for months some of our cases

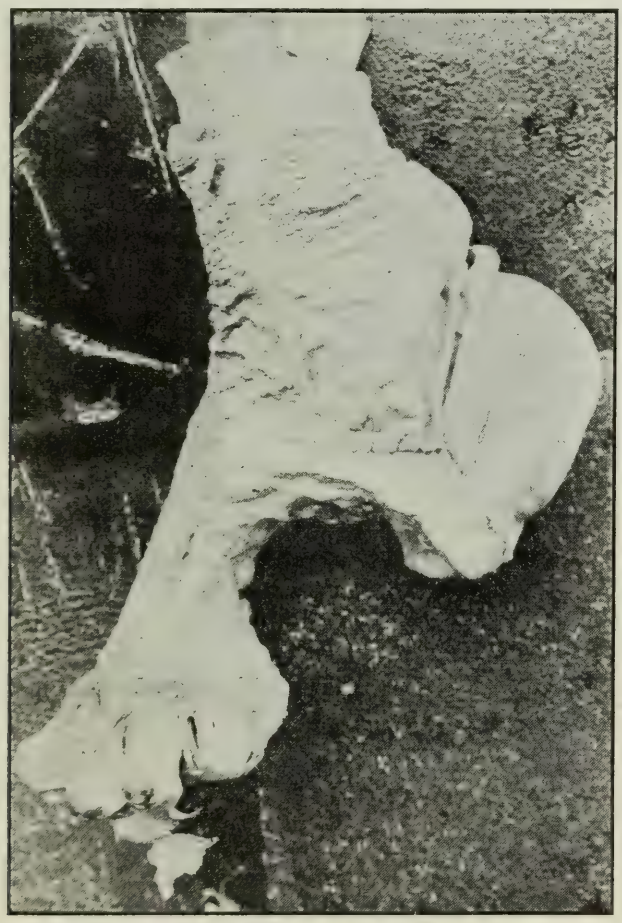

Fig. 1.—This shows the process of amputation in leprosy. In about three months longer this foot would have been amputated. No pain and very little hemorrhage, though there is usually discharge, and this is very likely the way the infection is spread. Nearly every leper has some open ulcer on his foot.

Fig. 2.—A very bright little girl in the leper home, an extensive tubercular type. The disease has gained so before entering that she can probably never be restored to health. So often a mother is ashamed to let it be known that her child is a leper and they are kept in hiding until it is too late to help them very much.

find that they can take the oil by mouth and continue in good health. At Carville, La., they seem to feel that their best results are obtained by large doses of the oil by mouth, some taking enormous doses such as 60 minims, three times a day.

Last March (1922) we parolled ten cases as probable cures. They were examined and all evidence of the disease was absent. They will be examined on our return to the field in September for any recurrence of the disease. Of the 180 cases parolled from Hawaii as cures,

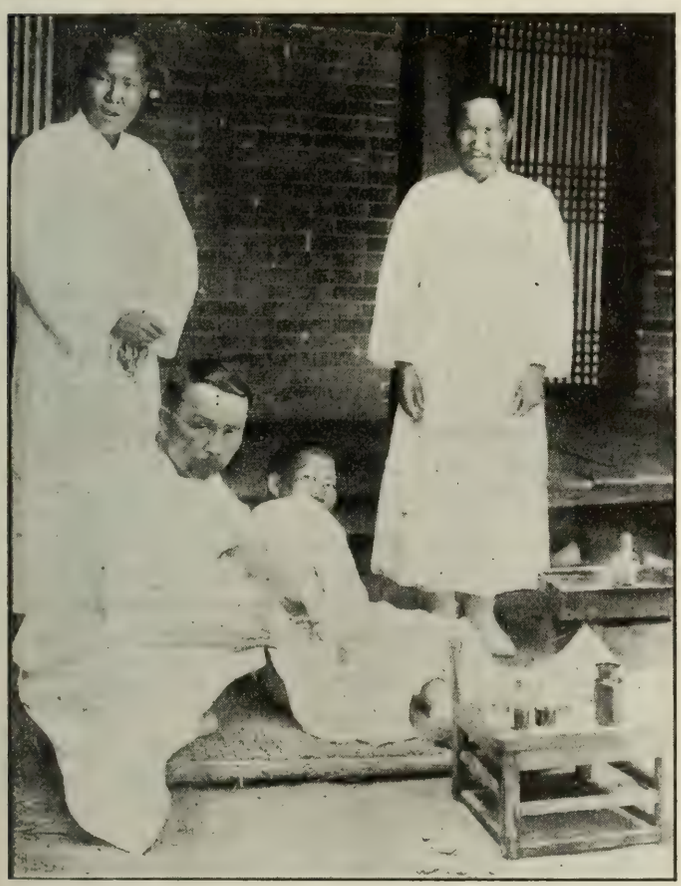

Fig. 3.—Our home-made leper doctors giving the injection of the chaulmoogra oil. They care for the sick, do the dressings and all minor medical work, some minor operations like amputations, etc. They are quite skillful with the microscope and can diagnose the more common diseases.

only 8 per cent showed a return of the disease after one year's time, so this offers very great hope of cure.

P. Hopper says: "The favorable results of treatment at Malokai have been due to the general hygienic treatment and to the intramuscular injection of chaulmoogra oil, mostly by the Mercedes method." He has used also with good results the intravenous injection of chaulmoogra oil 500, sulphuric ether 500, and iodin gr. 1.

There is no doubt that we have in chaulmoogra oil a specific for leprosy, and that with patient, prolonged and persistent treatment, encouraging results will be shown. The best results will be shown in the young and in the early stages of the disease. The general and hygienic measures should be insisted upon, especially a regular and systematic form of exercise or labor.

DISCUSSION

Dr. Victor G. Heiser, International Health Board, New York, N. Y.—Most of us here in the United States, who live among comforts and luxuries such as are not enjoyed in any other country, do not realize that throughout the habitable zone of the world we have representatives who are doing fine work amid trying conditions. It has been the custom to decry the efforts of medical missionaries, but I have seen a great deal of the work done by missionary doctors and I want to take advantage of this opportunity to pay them tribute. They may not be specialists, but their talents are many. For example, I found Dr. Wilson doing surgery, doing good work in leprosy, establishing leper colonies, building hospitals, building roads, and doing it all splendidly.

While I was Director of Health for the Philippine Islands I had unusual opportunities to study leprosy, and since then I have visited many leprosariums in various parts of the world. Personally, I do not regard a leper as cured until he has been free from the disease, clinically and microscopically, for a continuous period of at least two years. I have seen a number of cases that remained negative for ten or twelve years. The treatment introduced by Dean, Hollman and McDonald, in Honolulu, is doing great good, and within a year or two we ought to have some very definite figures as to its value. The experience in Honolulu shows that apparently 20 per cent of lepers can be cured with the ethyl esters provided the disease is not of more than five or six years' duration and the cases are not beyond young adult life; 50 per cent undergo a cosmetic recovery or are greatly improved clinically, but the leprosy organism does not disappear, in 20 per cent the disease is almost completely arrested, but the cases show no signs of improvement, and the remaining 10 per cent are apparently not affected.

Dr. Wilson, as I remember it, was using chaulmoogra oil with camphor, and was getting results comparable with the ethyl esters.

Dr. J. B. Shelmire, Dallas, Tex.—Am I to understand that chaulmoogra oil was used in leprosy a hundred and fifty years before Christ? I find that many physicians are under the impression that chaulmoogra oil is a recent discovery. While I was an interne of the Charity Hospital, in New Orleans, in 1881, the remedy was used in all cases of leprosy.

Dr. J. L. Kirby-Smith, Jacksonville, Fla.—Some five years ago I saw a very beautiful case of macular leprosy. Quite a few cases originate in Florida, especially in the lower part of the peninsular, and some five years ago, as I stated, I saw this case of maculo anesthetic leprosy. The patient was a young man seventeen years of age. The father was in fairly good circumstances, and I suggested to this young man that he move North. He went to Indianapolis. He was a fine boy, and intelligent, and I insisted that he get a job and do some heavy work. I put him on strychnin and tonics. I saw him three years later and he then had no sign of leprosy on his body. Two years after that (this year) he developed some sickness and developed nodular lesions about the face that any one could recognize. He is now a patient in the National Lepra Sanatorium in Louisiana. Of course, we all know that general medical treatment will help some. In the last year and a half I have had in my office three cases of nodular leprosy which developed in Florida. I believe we could promise almost a cure if we could get these cases early and use chaulmoogra oil and x-ray with good general medical attention. The patient first cited was a case of positive leprosy, and the change of climate from Key West to the North, and general medical treatment along with heavy mechanical work, arrested the disease.

Dr. Earl D. Crutchfield, Galveston, Tex.—We see some leprosy in Galveston. In a recent survey we found twenty-six cases that had developed on Galveston Island. Those cases had developed from nine different foci. All of the cases could be traced to nine different areas in the city where, at one time or another, some of these cases had lived.

In 1913, Dr. Singleton started treating these cases with chaulmoogra oil. They were given a mixture of chaulmoogra oil and some volatile oil with camphor, and were given as large doses as 20 c. c. Considerable pain is caused by the injection, and as they got better they would drop it. In 1918, they were rounded up again and we began the use of sodium gynocardate. We have treated approximately twenty-six of these cases, taking it in the nodular type and the macular and anesthetic types. Taking all types into consideration, we have found this to be a fairly satisfactory method of treatment. In the beginning of the treatment nasal smears are made in all cases. At the end of two years, in over half of the cases, we are unable to get any positive smears. In over half of the patients with the nodular type we were not able to find any lepra bacilli, particularly in young individuals, with macular leprosy. We feel that in two years' treatment we have probably gotten a cure, but just in the last few months one of those cases that we thought was a cure appeared at the clinic with what seemed to be an erythema nodosum. However, because the patient had been a leper a biopsy was done, and we found the nodules to be leprous.

We have given from 1 to 5 c. c. of the sodium gynocardate intravenously, and for the last six months we have been giving the ethyl esters of chaulmoogra oil. We have found that the cases, particularly the fulminating type, have been made worse at first by the use of the ethyl esters. The patients complain of extreme dyspnea after injection and they are put in bed sometimes for several days. Of the private patients we have some who have been receiving the injections for over a year, and the nasal smears in three of these patients are now negative. With the early paresthesia we have been able to relieve the pains in the legs and arms. In two negro boys who had macular leprosy the sensation has returned. We are able in many cases to get nice clinical results, but a great many cases come back later.

Dr. William Allen Pusey, Chicago, Ill.—It seems to me that the work that has been done in leprosy in the last few years is portentous. Leprosy until lately was regarded as absolutely beyond us, but now the men working in leprous districts have found that something can be done for the disease. The work in the Orient and the Sandwich Islands has shown that there is a chance of arresting the disease in many cases and getting a symptomatic cure in many more. This is a portentous fact, and I believe that the recent work in leprosy will prove to be one of the great achievements of medicine of the early part of the Twentieth Century. The various methods of treatment that are being used are subsidiary. The big fact is that some leprosy is being cured. All of this work has been done by Government officers or by missionaries, and I have the greatest admiration for the men that have been doing it. The results are not the product of us who are easily situated and have every facility at hand. It has been done by men at work in the field. I had occasion recently to review a book on leprosy written by a British officer of this sort. He took up leprosy in a way that showed you that his information was based upon first-hand experience; how to arrange leper settlements; how to house the lepers; how to clothe them; how to give them employment; how even to prepare the remedies from the crude material. These men in the field are doing the work all of the way through, are doing it well, and they have my unbounded admiration. This Section, I think, should pride itself upon having upon its program a paper by one of these field workers who brings us direct information of what is being done.

Dr. William H. Mook, St. Louis, Mo.—Leprosy is essentially a disease somewhat analogous to syphilis. It affects all the organs and all parts of the body. I think the eventual treatment will be some serum or antibody similar to vaccination that will cure or prevent it.

The unfortunate thing in the United States is that once the diagnosis is made the patient becomes an outcast. They are not subject to that sort of thing in foreign countries. I was talking to Dr. Crutchfield about the leprosy situation down in Galveston, and he says that practically all the lepers are among the foreign inhabitants. In New York City there are probably seventy-five or one hundred lepers, and none of them is native-born. They are foreigners, imported cases.

Our Government, sooner or later, will have to establish a leprosarium somewhere, where all of

our American cases can be isolated. They are doing that work now and are sending the cases to Louisiana. The work of the missionaries is bringing to us more every day the necessity for that, because it is one disease that has been isolated and its spread limited by isolation. In the course of time all the cases will have to be isolated.

Dr. Victor G. Heiser, International Health Board, New York, N. Y.—In connection with the treatment of leprosy, it is very curious that the ethyl esters of chaulmoogra oil apparently produce widely varying results in different parts of the world. For instance, the ethyl esters of the same lot as those used in Hawaii did not produce good results at the Government Leprosarium at Carville, La., and at the leper hospital at San Francisco, Calif. On the other hand, the results in Hawaii and the Philippines were satisfactory. Several cases treated recently in London with the ethyl esters did not respond satisfactorily to the treatment. I know of no explanation to account for these differences.

The encouraging thing about the whole problem of leprosy is that there is actual scientific research going on in different parts of the world with regard to it. Up to ten or fifteen years ago very little work of a really scientific nature was being done. Just what can be accomplished by modern medical science is well illustrated in the developments of the treatment for leprosy. It is one of the achievements of the early years of the Twentieth Century that we have made some progress in treating this disease, which has afflicted mankind since the beginning of time.

Dr. Wilson (closing).—I would like to show you this picture of a syphilitic whose face, one eye, nose, etc., were destroyed. This shows what a syphilitic will come to if untreated. We took him into the leper hospital, as he could not live long, and the lepers said: "That is not our disease, but some bad condition. That fellow is really sick."

I have seen cases of syphilis showing far greater destruction and making far worse appearance than that of any leper who has ever come to us.

I believe that syphilis is a far greater menace and problem to this Country than leprosy. There is a great possibility of eradicating leprosy from some of these lands and the world if undertaken properly, but no such hopes for syphilis, it seems to me.

As to the use of ethyl ester, I have seen no change at all after six months' treatment with ethyl ester on old cases previously treated by the oil injections, but a new case will respond readily and you will see improvement after a few months' treatment with either. I believe that the treatment with the oil is better, because in it you have the ethyl ester and probably other important ingredients.

I have my cases divided into three sets at present, one-third on chaulmoogra oil with 1 per cent camphor, one-third with ethyl ester as manufactured by the Rockefeller people in Peking, and one-third on ethyl ester as manufactured by the Japanese Government in Seoul by Dr. Shiga.

Some very encouraging reports have been received from the use of chaulmoogra oil. One case that I sent out three years ago and forgot to mention has been well for three years. He came back this spring and we took his picture, and he showed no evidence of the disease at all. That is one case I have noted that shows no return of the disease after three years' time. He became a school teacher, married, and is now in perfect health.

A CASE OF CONVULSIONS FOLLOWED BY AMNESIA*

By Philip F. Barbour, M.D.,
Louisville, Ky.

As old age approaches, memory gradually grows less trustworthy and reliable. Psychologists tell us that memory is a complex phenomenon, and that the loss of memory passes through four stages. These are quite definite and are as follows: (1) loss of memory for recent events; (2) for ideas; (3) for emotions; and lastly (4), for actions.

The old man recurs most often to experiences of early life and forgets recent events. His ideas are meager and limited. The natural affections grow colder and they become more self-centered. Action gradually disappears. Ribot, in his "Diseases of Memory," states that the same sequence may occur as a result of diseases or accident. He records many interesting cases illustrating various kinds of forgetfulness. One was that of a German who came to this country and acquired a good use of English, and as a result of a blow on the head, forgot English entirely, his most recent mental acquisition, but remembered German perfectly. The simple is remembered more easily than the complex because less differentiated and more often repeated in experience. Muscular activity is the lowest mental process, and therefore most persistent in memory. Ribot points out that memory returns in exactly the opposite order to its loss.

A little girl aged sixteen months was seen in July. She had had a long and severe convulsion four days previously and slighter convulsions off and on afterward. She had had a rather more

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severe convulsion shortly before I saw her. A large enema brought foul feces, the temperature dropped to normal and there had been no more convulsions.

The first examination revealed no paralyses, all reflexes were normal, and she showed active resistance to all the handling necessary for examination. There were no aural or other symptoms to indicate any localized cerebral lesion then or afterward. Six weeks later she came to my office with the additional history that she had gradually learned again to walk and feed herself, such actions being largely under control of the sub-conscious brain. For some time she did not differentiate between her parents and strangers. Her expression was rather blank and she did not speak any word. After that time her mother wrote that she knew the members of the family, was bright and playful, and was learning words again in the order that children usually pick up words.

Words show a very high degree of mental development and association and will naturally be acquired more slowly.

This child, as a result of a severe convulsion, lost her memory for words, her recognition and affection for her parents, and her physical coordination. They returned to her in the reverse, order as would be expected.

What the nature of the damage was and its location cannot be determined. Exactly similar symptoms with reference to the memory may result from disease or injury. The prognosis in this case is good. We so often see permanent paralyses or mental impairment follow such traumatism of the brain as occurs in convulsions, that this case with slightly different mental symptoms is reported, that we may have a wholesome respect for a symptom that is sometimes minimized.

DISCUSSION

Dr. Owen H. Wilson, Nashville, Tenn.—I am glad to hear Dr. Barbour emphasize the after-effects of convulsions. This convulsion probably was of toxic origin. We are too apt to say after the convulsion is over that there will be no after-results, but we do not know. There may be some damage to the brain. We cannot locate the center of memory even approximately. We may find after convulsions some lesion, usually cortical, which may result in more or less permanent disorder. Convulsions, toxic in origin or from any cause, may produce brain pathology and the beginning of epilepsy. I hope Dr. Barbour's case will be permanently well, but I would not be too sure.

Dr. John Zahorsky, St. Louis, Mo.—We have many factors producing convulsions in children, for instance, toxic convulsions which are not followed by bad effects. I am not saying that convulsions cannot produce hemorrhage in the brain, and we know that hemorrhage in the brain produces convulsions. But it is the brain lesion that causes the convulsion and not the convulsion the brain lesion. The fact that there was a slight spasticity of the calf muscles in this case would show that there was a lesion in the brain which caused the convulsions.

Dr. A. G. Jacobs, Memphis, Tenn.—We are familiar with the effect of toxins on the baby's cerebrum. We know they can show any symptoms from a mild delirium to convulsions and complete unconsciousness. I am inclined to think that most of these are purely toxic, that there is no real pathologic lesion; only an irritation of the cortex by the absorbed toxin or from other toxins. We may have a prolonged irritation of the cortex from toxins without any pathologic lesion, lasting for days. Convulsions do not produce these lesions, but the same thing in my opinion which produces convulsions is responsible for many other manifestations on the part of the cerebrum.

Dr. Barbour (closing).—It is very difficult to determine whether a convulsion will result in an injury to the brain. There are many cases in which the convulsion has come, probably in connection with a toxic condition in the intestine and where the damage has occurred in the brain at the same time. This can result from severe toxemia causing either hemorrhage or some other lesion in the brain which may be permanent. We have all seen children who had convulsions with no evident lesion in the brain or other bad after-effect. This child had peculiar mental symptoms; no paralysis, but simply transitory disturbances of memory. I suggest that we might watch for effects of convulsions other than the more obvious one of paralysis.

A CASE OF CONGENITAL SYPHILIS WITH ASCITES*†

By Ralph C. Spence, M.D.,
and
L. C. Tittle, M.D.,
Dallas, Tex.

Randall C., a white male, age 15 years, came under our observation January 5, 1922, complaining of enlargement of the abdomen, marked emaciation, and loss of motion in his joints.

Family History.—The mother and father were both living and well. There was one sister, age 17 years, living and well. The mother had one miscarriage at six months, her first pregnancy. The next pregnancy was full term, but the child

*From the Medical and Surgical Clinic.

†Read in Section on Pediatrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

died in infancy. The father admitted having had a chancre when a young man, and seven years previously he had had a nervous breakdown, which cleared up under anti-luetic treatment.

Patient's History.—The delivery of the patient was normal and the cord healed promptly. He was a normal baby until two months old. At that time he started to vomit frequently. He continued to have frequent gastrointestinal upsets and was pale and under weight until he was two years old. His teeth came late and he did not walk until after he was two years old. At 5 years of age he developed "iritis." At 6 years his adenoids were removed. Soon after this operation he developed the measles and his left eye became infected. This was opened and drained three times and was diagnosed as chronic dacro-cystitis. Three years previous to our observation a tumor appeared on his sternum. This ruptured spontaneously, healed once or twice later, and then ruptured again. Two years previously he developed an ulcer on his forehead and there was one in his mouth when he first came under our observation.

Three months previous to our observations he vomited blood several times. A few days after this his abdomen began to increase in size. About the same time his joints became sore and painful, but not red. There was no elevation of temperature. His appetite was poor and his bowels regular. He had been bed-ridden for three months, during which time his abdomen had slowly increased in size, and the emaciation of his extremities had become more marked. He had been treated by many physicians for many things, especially lues and rickets.

Physical Examination.—As will be noted in the slides, the patient was poorly developed and poorly nourished. His abdomen was greatly enlarged and his extremities were markedly emaciated.

The movements of his eyes were normal. The lacrimal duct on the right side was stopped up and tears escaped over his face as a result. There was some cloudiness of the cornea on this side. Both pupils reacted to light and distance. The hair was dry and course. There was some seborrhea of the scalp with a moth-eaten appearance in places. The skin was pale and dry. There was a scar 1 cm. in diameter just to the left of the midline of the forehead, the border of which was attached to the bone. There was an ulceration 2 cm. in diameter over the sternum and right sterno-clavicular joint. This ulcer had a pink border and the underlying bone was involved. The tongue protruded to the right. The papillae were prominent and the breath was foul. There was marked pulsation of the vessels in the neck. The heart was apparently enlarged and pushed upward. There was a loud blowing systolic murmur over the whole precordium which was loudest at the base.

Both elbow joints were ankylosed with the forearm at right angles to the upper arm. The motion was limited to from 40 to 60 degrees. There was some tenderness of the right wrist with limitation of motion. All the finger joints were swollen. Both knee joints were enlarged and the knee caps were floating. Motion in these joints was painful, but not limited. The muscles of the extremities showed marked atrophy. The reflexes, both superficial and deep, were normal.

The blood Wassermann was strongly positive. The hemoglobin was 38 per cent. The red blood cells were 2,430,000. There were 6800 leucocytes with a differential of 67 per cent polymorphonuclears, 19 per cent small lymphocytes, 11 per cent large lymphocytes, and 3 per cent transitionals. The urine showed a trace of albumin with an occasional hyaline cast.

Treatment.—The abdomen was tapped on eight different occasions during the first three weeks after the patient came under our observation. From 400 to 500 c. c. of a thick, turbid, straw-colored fluid, slightly alkaline, with a specific gravity of 1012, were obtained at each tapping.

Because the abdominal fluid bordered between an exudate and a transudate a pneumoperitoneum was done with this report: "There are no adhesions of the intestines to the abdominal wall. The liver is slightly enlarged and lobulated, giving a very irregular contour to the lower border. There is still some fluid remaining in the abdomen. The spleen is not markedly enlarged. The kidney shadows are overshadowed by fluid."

The patient was given the maximum doses of potassium iodid and protiodid of mercury by mouth. Neoarsphenamin was given intravenously. After three weeks' time the fluid no longer accumulated in the abdomen. Since then there has been marked improvement in every way. At present the patient is going to school and his activity is that of a normal boy of his age.

DISCUSSION

Dr. Charles Boynton, Atlanta, Ga.—Ascites in connection with syphilis is a very rare condition. I do not recall ever having seen a case where the patient had the two conditions. In this patient the edema was over the entire body and the abdomen could not escape. In two minutes, of course, one cannot attempt a discussion of congenital syphilis.

TROPICAL DISEASES AND PUBLIC HEALTH

VIRULENT DIPHTHERIA BACILLI ISOLATED FROM CHICKENS SUFFERING FROM ROUP*†

By William Litterer, A.M., Ph.C., M.D.,
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School of Medicine,
Nashville, Tenn.

In the literature there is no reference pertaining to the demonstration of virulent diphtheria bacilli in fowls. Such a finding opens up a new field as a means of dissemination of the Klebs-Loeffler bacillus. Various animals such as the cat, dog, and even the horse, have been suggested from time to time as carriers of the infection.

Considerable reference is made in the literature to cases of diphtheria occurring especially in cats. Thirty years ago Klein[1] described lesions in cats which he considered typical of natural infections with the Klebs-Loeffler bacillus. Low,[2] in 1888, reported the occurrence of four cases of diphtheria in one house which he thought had been carried by a pet cat from another case in the same neighborhood. Cultures from this cat contained morphologically typical Klebs-Loeffler bacilli. Karlinski, in 1908, published observations of an outbreak of diphtheria which resulted in the death of seventeen out of twenty-four Angora cats. He stated that typical pseudo-membranous lesions were found from which he isolated virulent diphtheria bacilli. He also reported a number of cases of diphtheria in children who were infected after contact with sick cats. Probably the most convincing article concerning the cat as a carrier is by Major Simmons.[3] He isolated diphtheria bacilli, virulent for guinea pigs, from two cats which were pets of a person who contracted a fatal diphtherial pharyngitis. Stray animals of the same species caught in the environment gave negative cultures. These bacteriologically controlled observations, including the suspected human victim, lend a greater probability to the long-heralded impression that cats may contract diphtheria from human subjects and that in turn these animals may communicate the disease to man.

The beginning of my investigations came about in a very unique manner. To Dr. W. T. Robinson, of Murfreesboro, Tenn., is due the credit of calling attention to the fact that chickens suffering with roup simulated human diphtheria. During the fall of 1921, Murfreesboro, Tenn., with a population of about 6,000, situated thirty miles from Nashville, was visited with a severe epidemic of diphtheria, during which many of the schools were closed. On October 16, 1921, Dr. Robinson sent me four swabs obtained from the throats of chickens suffering with roup. To my surprise they contained the Klebs-Loeffler bacillus, which subsequently proved virulent to guinea pigs. Later, six other swabs were sent with similar findings.

I wrote Dr. Robinson requesting that he furnish all available data at his command concerning the roup-diphtheria outbreak in the fowls. In December he wrote the following:

"This epidemic of roup from which I have sent you about a dozen specimens occurred among fowls owned by Fox and Potter, neighbors, whose poultry yards are in apposition. Mr. Fox has 75 fowls. Among this number eleven developed roup and six died from the disease. Three chickens were treated with 500 units each of diphtheria antitoxin and all recovered promptly.

"Mr. Potter had thirty fowls and ten were infected with roup. Five died and three were treated with 500 units each of diphtheria antitoxin. Two recovered promptly and one died. The one which succumbed was practically moribund at the time of administration of the antitoxin." Dr. Robinson further stated that in making cultures from the throats of school children in the city, a girl in the Fox home about thirteen years of age was found to be a carrier, and also a boy about sixteen years of age from the Potter home. There were no active cases of diphtheria in either family.

In my conversation with Dr. Robinson he stated that the fowls that were given

*From the Department of Bacteriology of Vanderbilt School of Medicine.

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antitoxin were all advanced in the disease and three of them were unable to walk. A few hours after the administration of the antitoxin, marked improvement was noted and rapid recovery resulted. Those that were treated with antitoxin recovered in a few days, while in those not so treated a 50 per cent mortality resulted and the surviving 50 per cent ran a course of from two to eight weeks. The Fox girl, aged 13, and the Potter boy, aged 16, proved to be persistent carriers. The Klebs-Loeffler bacilli isolated from these two cases proved to be virulent to guinea pigs.

The disease called "roup" by poultrymen is a contagious catarrh, closely resembling the more malignant forms of influenza in the larger animals and in man. It attacks principally the membrane lining the eye, the sacs below the eye, the nostrils, the larynx and the trachea. It is attended with high fever and is very contagious. The nature of the micro-organism which constitutes the virus is not known. The saliva and the discharge which escapes from the nostrils carry the contagion and soon contaminate the drinking water and feeding troughs, so that all susceptible fowls are infected. Even the flocks in adjoining yards are infected by the particles of mucus projected into the air when sneezing or shaking their heads in their efforts to free the air passages from the thick mucus. The disease is distinguished from fowl diphtheria by the absence of a thick, tough and very adherent newly-formed membrane (false membrane) in the nostrils, mouth, and throat of the latter. Fowl diphtheria is caused by a filterable and invisible virus and, therefore, is entirely distinct from the diphtheria of man which is caused by the well known Klebs-Loeffler bacillus.

It is not entirely clear whether the chickens under question were suffering with roup or fowl diphtheria since they had pseudo-membranes in their mouths and throats.

BACTERIOLOGICAL DATA

Ten swabs were sent to me by special delivery mail by Dr. W. T. Robinson, of Murfreesboro, Tenn., having been obtained from the throats and nasal secretions of ten fowls affected with roup or fowl diphtheria. The swabs were those ordinarily used for diphtheria work consisting of a pledget of cotton wound around a wire at the end and inserted in a test tube plugged with cotton. They were previously sterilized in a hot air sterilizer for two hours at 170° C. Each swab was inoculated with three Loeffler blood serum slants and incubated for twenty-four hours. Several characteristic colonies were isolated from each tube, transferred to Loeffler's blood serum and grown for twenty-four hours at incubator temperature. Those colonies responding tinctorially and culturally to the Klebs-Loeffler bacillus were inoculated into broth cultures to be tested for their virulence to guinea pigs, which will be given later in the paper.

Morphology. — Incubator temperature for twenty-four hours on Loeffler's blood serum showed organisms for the most part long and slender, revealing polar granules, prevailing terminal in location, and with a marked tendency to typical group arrangement in angles and parallels. The types encountered would be classified C and D on the Westbrook scale, with the long, slender form, C, predominating. They were Gram-positive; and Neisser-positive and not acid-fast predominated in smears from the younger colonies.

Cultural Characteristics. — Colonies were grayish-white, moist, confluent and non-adhesive after growing on Loeffler's serum medium at incubator temperature for twenty-four hours. After several days' incubation they became yellowish. There was no proteolytic action in the cultures six weeks old. On plain agar the growth was definite, but feebler and scantier, and the individual colonies were tiny. In litmus milk a trace of acid without coagulation developed. In glucose infusion broth cultures, a granular deposit was formed without clouding. Pellicle formation occurred. The tests for the action on sugars were performed with sugar-free broth, to which the sugar was added prior to the final sterilization. Acid without gas was formed in glucose, maltose, and dextrin; alkali, in manite and inulin; while no

change in reaction occurred in lactose, xylose, and arabinose broth cultures.

The staining, morphology and cultural characteristics of the bacilli isolated from the Fox girl and Potter boy were practically identical with those isolated from the fowls.

Virulence Tests.—For the determination of virulence, guinea pigs weighing 300 grams each were inoculated subcutaneously with 1 c. c. of a forty-eight-hour broth culture. A positive result was recorded when the animal died within four days after injection and showed characteristic injection edema at the sight of inoculation with hyperemia of the adrenals. The controlled animals received the same dose, were immunized with 500 units of antitoxin and remained well.

Of the ten cultures from fowls, two killed pigs in two days. Five cultures killed in three days and three killed in four days with characteristic lesions. Cultures from the Fox girl killed in four days, while the Potter boy cultures killed in five days with characteristic lesions using control immunized pigs.

Experiments Upon Healthy Fowls.—Three healthy fowls were used. Preliminary cultures were made in order to show that they were free from diphtheria bacilli at the beginning of the experiment. The inoculations were made by introducing into the posterior nares and throat a swab which had been soaked in a thick opaque suspension of diphtheria bacilli that were isolated from fowls. Each fowl was kept in a separate cage. Nasal and throat cultures were taken at two-day intervals. At the end of six days one of the fowls proved negative to the diphtheria bacillus, while in three weeks the other two fowls showed negative to the Klebs-Loeffler bacillus. In these experiments it was noted that the number of diphtheria bacilli diminished in number every two days in which cultures were taken.

No membranes were noted or clinical evidences of diphtheria observed in any of the fowls.

Experiments on Fowls with Roup.—Two fowls were selected with severe cases of roup and subjected to the identical technic employed with the healthy fowls. Cultures were made every day for Klebs-Loeffler bacilli. One of the fowls died on the seventh day, the other on the ninth day. Cultures showed that the Klebs-Loeffler bacilli had diminished on each successive day, but persisted at the death of the fowls. No membrane or clinical evidence of diphtheria presented itself. It is believed that the Klebs-Loeffler bacilli contributed in no part toward their death.

In healthy fowls the carrier state was difficult to produce and was generally quite transient. It is a question whether the diphtheria bacilli had actually multiplied or merely persisted in the nasal passages. Although negative "carrier" results were obtained with two fowls with the roup, this is not enough from which to form a general conclusion. It is evident that a greater amount of experimentation would be necessary to clarify this question.

CONCLUSIONS

(1) This is the first instance, as far as I have been able to find in literature, in which virulent Klebs-Loeffler bacilli have been isolated from fowls.

(2) It is probable that the fowls received their infection from human beings harboring virulent bacilli, since persistent virulent carriers were demonstrated in the families that owned the fowls.

(3) Experiments upon healthy fowls failed to produce a permanent carrier state. Certainly nothing corresponding to carriers as seen in man was observed. Negative results were also obtained in two fowls suffering with roup.

(4) The demonstration of virulent Klebs-Loeffler bacilli in fowls opens up a new field for the means of dissemination of the Klebs-Loeffler bacilli among human beings.

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DISCUSSION

Dr. W. S. Leathers, University, Miss.—One phase of this subject deserves consideration from the standpoint of public health. It seems to me, based upon the findings of the investigation made by Dr. Litterer, that there is a possibility of sporadic outbreaks of diphtheria occurring among children handling fowls which have viru-

lent diphtheria bacilli in their throats, either during the disease known as roup or following this condition. From an epidemiological standpoint, I do not think that it is likely that a carrier condition among fowls, the result of exposure to human beings who have virulent diphtheria bacilli in their throats, would be a very potent factor in the transmission of diphtheria. However, I think that it is one meriting consideration, and in the event of an outbreak of diphtheria, it is well to keep in mind the results of the investigation made by Dr. Litterer, which are of decided value.

Diphtheria is not a very contagious disease. It is not transmitted so easily as many other infectious diseases, but the transmission of bacilli from one individual to another is the common mode of the spread.

The paper as presented by Dr. Litterer deserves thoughtful consideration from the viewpoint of sporadic outbreaks of diphtheria, but we should not consider the question of diphtheria bacilli in the throats of fowls as a decided factor in the transmission of the disease.

Dr. C. C. Bass, New Orleans, La.—The subject discussed by Dr. Litterer deserves a great deal of consideration. The diphtheria bacilli that have been recovered from fowl diphtheria in the past have not seemed to be identical with the one that produces diphtheria in man. If Dr. Litterer is right that the organism is capable of producing the disease in man, and that they are perhaps identical organisms, then it is quite possible that this is another source of endemic or latent diphtheria. It is another possible source of outbreak.

It would not be, as Dr. Leathers has indicated in his discussion, the probable source of much of the diphtheria that we have, for the number of cases that could come from this source would be extremely small. However, if it is the source of an occasional case, that case might be the cause of an outbreak consisting of a very much larger number of cases.

My own feeling is that it is desirable that this idea should be confirmed by transmission of the disease from fowl to fowl and, if possible, by identification in some other way, of the organism found in the fowl with that found in man. We must remember that there are a good many diphtheria-like bacilli known and recognized, more than one of which is pathogenic for animals, and it would really be rather difficult to determine whether the organism found in fowls can actually be transmitted to man without an experiment which would hardly be justified. Even the successful inoculation of fowls with the organism from human diphtheria does not prove the thing. We have to do it the other way around.

Dr. William Krauss, Memphis, Tenn.—Dr. Litterer's findings appear to me to be very convincing. He made a culture of the organism which he recovered and inoculated it into guinea pigs protected by ordinary diphtheria antitoxin, and those guinea pigs were proof against this particular organism. We are, in the absence of contrary evidence, driven to the conclusion that what Dr. Litterer was dealing with is what we know as the Klebs-Loeffler bacillus. On the other hand, if this is the only report of this condition, we shall have to make more investigations as to how often this thing can happen, because bacteriologists are definitely committed to the view that roup is a mixed infection, and that a diphtheria-like organism is a secondary invader, so the idea that there might be something like the diphtheria bacillus in roup is not new. Certainly the discovery of the typical Klebs-Loeffler bacillus must be looked upon as something quite unique, and it would require a considerable amount of confirmation from a large number of sources that it is a usual occurrence. I am inclined to doubt it.

Dr. James A. Hayne, Columbia, S. C.—There is an impression among the laity that black tongue among dogs can be cured by diphtheria antitoxin, and I have found, in the distribution of diphtheria antitoxin in my State, that quite a number of dogs are named as human beings and treated with diphtheria antitoxin. Now, if roup is to be treated with diphtheria antitoxin, the number of chickens in my State being large, I can foresee quite a large demand for antitoxin.

It seems to me that Dr. Litterer has made a very unique contribution to epidemiology, if he is correct in his findings and if his findings are confirmed. I know that South Carolina is largely an agricultural state, and the people are rather isolated. Yet at times we have found diphtheria where it seemed to be impossible to trace it to any source outside the farm or farmhouse where the child lived. It is possible that chickens were brought to those isolated farms and carried with them the disease.

Dr. Litterer (closing).—Roup is confused by some with fowl diphtheria. Both are entirely different from human diphtheria. In fowl diphtheria there is the characteristic membrane of the nose, throat and trachea. It is caused by a filterable virus. Roup is also caused by a filterable virus, somewhat similar to fowl diphtheria, except that no membrane is encountered. Whether these chickens were suffering from roup or fowl diphtheria or a combination of both, I am unable to say. They undoubtedly had human diphtheria of the real virulent Klebs-Loeffler type, engrafted upon some other condition. It is quite evident that no pseudo-diphtheria bacillus can produce a toxin. These chickens were suffering with a toxemia which was caused by the elaboration of the diphtheria toxin by the Klebs-Loeffler bacilli that were found in their noses and throats. Proof of this is shown by the administration of antitoxin by Dr. Robinson with the phenomenal results to those that were given the serum. Those not receiving the antitoxin either promptly died or had a protracted illness lasting several months. Another convicing proof concerning the etiology was the fact that the diphtheria bacilli found were virulent to guinea pigs. The pseudo-diphtheria bacillus can abso-

lutely be excluded on this ground alone. The diphtheria bacili were isolated from all the fowls repeatedly. They were the typical Klebs-Loeffler bacilli responding to all the tinctorial and cultural characteristics and belong to the types C and D of the Westbrook scale.

Since writing this paper I have made a number of investigations of roup among chickens, but have never found the diphtheria bacillus either in roup or in chicken diphtheria. So it is evidently a pretty rare condition.

One member of each family who owned the fowls was a persistent, virulent diphtheria carrier. The Klebs-Loeffler bacilli were identical in type so far as I could tell with the type of diphtheria found in the chickens.

Further investigation should be made with a view of ascertaining just how prevalent the condition is.

SCHOOL INSPECTION BASIC IN THE CONTROL OF COMMUNICABLE DISEASES*

By John Thames, M.D.,
City Health Officer,
Little Rock, Ark.

One of the most striking facts in the work of the public health program of today is the rapidly growing interest in school inspection. Boards of education are advancing the idea more rapidly than boards of health are able to provide equipment to operate the plan successfully. There also appears to be some difference of opinion as to what department school inspection should come under, whether it should be performed by the board of education or the board of health.

There are two parts to the question of school health supervision: one is the teaching of health, the other is medical inspection. One is so dependable on the other that we should unite them and use the general term "school hygiene." School hygiene is undoubtedly the most important study in the school curriculum. When properly taught, it requires the knowledge of a technically and professionally trained mind. It also requires the combined efforts of the board of education and board of health operating harmoniously together to accomplish the results for which it is intended.

School inspection was first instituted for the purpose of controlling an epidemic of diphtheria. In 1894, Dr. Dergan, Health Commissioner of Boston, Mass., at that time, conceived the idea that if he put doctors in the schools he might be able to stamp out the contagion at its source. The result of his experiment was sufficient to warrant the keeping of doctors in the schools to inspect the children in order to determine whether or not they were infected with any contagious disease. In 1896, Philadelphia instituted a system of school inspection as a means of contagious disease control. New York City did the same in 1897. The idea of school inspection has gradually increased until at present it would be difficult to find a city of any size that has not some system of school inspection. Without a single exception, the system of inspection was instituted and doctors placed in the schools to inspect children for the purpose of determining whether or not they were infected with contagion that might be communicated to other children.

School inspection is therefore accepted as a health measure, and as such should be directed by the local health officer. While it is necessary to have the support and cooperation of the board of education to accomplish the desired results, we should not lose sight of the fact that the main object of school inspection is to control contagion, either by discovering and excluding the children acutely infected, or instructing them in a knowledge of hygiene and sanitation that will better enable them to resist the invasion of disease. The ultimate responsibility rests upon the health official, therefore it is only right and proper that he should direct and control the policies of school health supervision.

It is a noteworthy fact, one that any municipality may well consider, that the large cities that first instituted a system of school inspection for the purpose of controlling contagious disease, under the board of health, have continued to operate under that system. Their records show a gradual reduction in cases and deaths from communicable diseases; and in every

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instance the results are in direct proportion to the extent of school inspection or school medical supervision done.

In the great city of New York during the influenza epidemic of 1918, Health Commissioner Copeland recommended not closing the schools, for it was his opinion that the system of school inspection would be more efficacious in the control of influenza than the closing of the schools would be. The schools did not close, and comparison of the record of New York with other cities that closed their schools on account of influenza shows that Dr. Copeland was correct in his idea of how best to control influenza.

In New York, Philadelphia, Detroit, Cleveland and other cities, the results have been sufficient to warrant the employing of an adequate number of doctors and nurses for school inspection, and in every city where the work is carried on in a systematic, efficient manner communicable diseases are being rapidly reduced to the minimum.

Where there is not an efficient system of school medical inspection; where the teacher does not look over her children the first thing in the morning and observe any signs of illness and refer any who are found with suspicious symptoms to the school doctor or nurse; where the school doctor or nurse does not carefully look over cases sent to him or her; where the nurse or doctor does not make regular routine inspection of all classes at frequent intervals to find evidence of contagion; where cases are not followed up and a correct diagnosis made, any school is likely to become a hot bed of infection. Conditions of this kind furnish a very good reason for parents of school children to blame the school for their child's sickness. In schools where the opposite conditions prevail, where there is efficient medical inspection, and where the board of education and board of health work harmoniously together, all these conditions are thoroughly looked into by trained inspectors. Cases are followed up in their homes, where the parent case is frequently found. Sometimes there is a carrier condition among one of the adult members of the family or in a child of pre-school age. At other times, the source is found in the family of a friend or neighbor, perhaps in another section of the city. The search for and finding of the source of contagion is an important factor in the control of disease. The vicious ring of a communicable disease is composed of three sections: the source, the mode or means of communication, and the victim. In order to control the contagion, the ring must be broken at one or more points. To discover and isolate the victim is not enough. A more thorough knowledge of the causes of infectious diseases has shown very clearly that the exclusion of infected children from school is not sufficient. Locating the source of contagion and cutting off the line of communication is essentially necessary for a complete control.

Professor Rosenau says we have at last discovered that the whole child attends school, the physical body as well as the mental, and the two are very closely allied. Where the body is found defective, there is almost always a corresponding mental deficiency. The greatest number of physical defects can be corrected through the teaching of health. Visualize health to the children and they will insist on having their defects corrected. The more a child is enlightened on the subject of hygiene and sanitation and what it means to be in possession of a reserve force of strength and energy, the more that knowledge will be transmitted by the child and disseminated in the home. School children are as capable of becoming carriers of health as they are of disease. Health is contagious when children become imbued with the health idea and the simple rules for conserving it.

The teaching of health is an important part of school hygiene and is an essential factor in the program of school medical supervision. Children are taught prevention by instructing them to conserve health and how to build up their bodies to resist disease, or at least to reduce their susceptibility to contagion.

The use of the Schick test to determine the susceptibles to diphtheria, and the successful use of toxin-antitoxin to immunize children against diphtheria is commonly conducted through a system of school inspection. This method of diph-

theria prevention has extended to the children of pre-school age. Drs. Park and Zingher, of New York, recommend that every child should be immunized before the age of entering school.

The requirement for successful vaccination of all school children and teachers has been the means of eliminating smallpox where the requirement is persistently enforced.

The instituting of instruction in oral hygiene in schools came as the result of medical inspection. At least 40 per cent of school children have defective teeth and 90 per cent have neglected mouths. It has been found that defective teeth and unclean mouths play a large part in reducing the vitality of children and causing them to be more susceptible to disease. A correction of these defects will materially aid in the control of disease invasion.

It seems useless to attempt to enumerate in detail what has been accomplished as result of school inspection, yet I do not believe it is being sufficiently recognized by the proper authorities. From my own experience and what I have been able to gather from other health officers throughout the country, I am convinced that school inspection is basic in the control of communicable diseases.

In Little Rock we have a splendid system of school inspection. The City Health Officer is Medical Advisor to the Board of Education, and there is absolute harmony between the Board of Education and the Board of Health. Regular courses of instruction are given in the schools, on nutrition, posture and systematic exercises, the most essential subjects for conserving health. While we have an insufficient number of full-time paid inspectors, there are always doctors and dentists ready to serve when called upon to assist in special work, and they give their time and knowledge unstintingly. This arrangement enables the Health Department to carry out the program to a large extent, and what has been done has been a wonderful assistance in controlling the spread of disease in Little Rock. We depend very largely upon school inspection for the discovery of the mild and overlooked cases of contagion and carriers. It is universally accepted that the first duty of a health officer in his effort to control communicable diseases is to discover the cases. I have found it much easier to control diphtheria and scarlet fever during the time school is in session. There is always an increase in cases immediately following both summer and Christmas vacations that we have been able to discover and control through our system of school inspection.

The only means we have to control the minor contagious diseases such as scabies, chicken pox and mumps is by school inspection, and I am of the opinion that when we have any success in the control of measles and whooping cough, it will come as the result of school inspection and the teaching of health in the schools.

I hope that this paper may be of assistance in stimulating doctors and health officials to consider the importance of school medical inspection.

DISCUSSION

Dr. J. A. Hayne, Columbia, S. C.—I wish to call your attention to a scheme which was carried out in South Carolina, not under the auspices of the State Board of Health. In fact, the Board of Health felt about it as we do a case of dynamite. There is a little town named Garnett which has a population of about 300, but with quite a number of people in the surrounding county. They built a high school which had a rather large number of children in it and decided this year that they would organize an association for the purpose of keeping their children well. They called it the "Keep Well Club," and every parent who had a child in the school could belong to the Club. The children were thoroughly inspected, they were weighed and examined in every way, and the parents paid $5.00 a year for each child. They selected a physician and they paid $5.00 to the physician to look after the health of the children. It was his duty to keep the children well. We have now in pamphlet form a full history of this experiment. It shows what the public is going to do about keeping their children well. This was not organized by doctors, by a state board of health, or by health officers. It was organized by the people who wanted their children to go to school and to keep well.

The appointed employee is a graduate physician and member of the South Carolina Medical Association, but fortunately for the experiment he was the only doctor in this town. He agreed for $5.00 a child to keep these children well, which gave him $1500 during the school term. The records show that there was less sickness

among the school children that year than was ever known and that every child gained in weight.

Dr. A. H. Hayden, Columbia, S. C.—The most vital need to supply deficiencies in public health work is to procure the daily cooperation of our educators in the public and private schools. Educators, from the highest educational institutions to the kindergartens of our states, are the very ignorant in regard to the health laws of their state, or they do not obey them, at least in the small towns and rural districts. The responsibility for thorough knowledge and obedience to health laws governing schools by pupils and teachers alike, begins with the state superintendent of education, goes on next to the county superintendent, next to the board of trustees, next to the principal, and last to the teachers of our schools. Some officer should be made responsible, to see that these laws are known and carried out to the letter.

We can accomplish little in the training of human beings unless we begin the training at the beginning of life. To my mind the most important thing to do is to devise means by which parents and teachers alike can be brought to a realization of the fact that the teaching of hygiene and sanitation must begin at the cradle and be taught daily and insistently from infancy throughout the early years of home and school life. If we have a systematic method of bringing these matters to the attention of home people, especially to mothers' clubs, for distribution to their community families, from the mothers we may make the demand universal that at least kindergartens and the primary grades shall devote most or all of their time to the thorough grounding of sanitary and hygienic laws into the minds of our children. As the twig is bent so the tree grows. Earliest impressions are lasting, and early training is the most important of all training. More, much more, time should be devoted to the teaching of sanitation and hygiene in the infant classes in our schools than is now given.

Dr. C. C. Applewhite, Jackson, Miss.—Dr. Thames stated that the local physicians lined up with him in everything he undertook. I wonder if he has undertaken along with his communicable disease control work any corrective work, and if so, what method he utilized in getting the corrections made. This work of correcting physical defects among school children has caused, in my experience, considerable disturbance. A plan whereby this work can be done to the satisfaction of the local physician would be very acceptable. I would like to take issue with one of the men relative to the school teachers. It has been my experience that school teachers, as a rule, are keenly interested in and have a fairly good knowledge of preventive medicine and can be reliably counted on to assist in carrying out any reasonable public health program.

Dr. Thames (closing).—Replying to Dr. Hayne, I do not find the physicians of Arkansas very different from those of South Carolina. My idea is that the manner in which you approach doctors determines whether or not they will cooperate with you in public health work. I have had no trouble in Little Rock in getting a sufficient number of physicians to make the special examinations of school children, nor have I experienced any difficulty in having all defects corrected where we were able to get the children to the public clinic connected with the City General Hospital. The majority of the clinic staff are either teachers or adjuncts in the Medical School of the University of Arkansas, and they have the opportunity of using all clinical material for demonstrating purposes.

I am sorry that I have no statistical report to show the percentages of improvements during the time that I have been in Little Rock; but hope that some time in the future I may have the pleasure of presenting another paper along this same line, when I shall give exact figures of what has been accomplished in correcting the various defects found among school children.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

RESTORATION OF THE BURNT CHILD*†

By V. P. Blair, A.M., M.D., F.A.C.S., St. Louis, Mo.

In the following I shall deal with reconstruction problems, not with the immediate treatment of burns. I shall use certain cases to illustrate my points, chiefly in the intermediate stages.

Burns of the hand are functionally most crippling, but burns of the face may be more appalling. Anything that attracts attention to the child in an unpleasant way, its own attention, the critical attention of other children, or ill-advised sympathy of adults, may produce an unfortunate reaction on the child's morale.

For all these reasons reconstruction of the child should be begun as soon as it is surgically practicable, and it is not always necessary for the wounds to epitheliate spontaneously before skin grafting or flap operations are begun.

Almost all of the cases that come to reconstruction have suffered burns that destroyed the full thickness of the skin, but rarely deeper than the superficial fascia. Reconstruction is seldom sought for the milder cases, and deeper burns are more frequently fatal.

It is on the ear and nose chiefly that the destruction is likely to go deeper. Except from the burns of powder and of corrosive fluids, the eyes themselves are seldom damaged.

The deformities we are called upon to correct consist primarily of the loss of skin which has been replaced by a retracting scar. If the contraction has persisted during the growing period, it is likely to be complicated by under-development of the parts affected, such as small fingers or short tendons, or by peri-articular fixations or joint and bone distortions.

Abnormalities of the scar itself that we have been called upon to treat have been keloid scar, early induration, late induration that may become cancer or the persistence of an active pus infection in the scar.

The first, the most important and absolutely controlling step in any of these restorative operations, is to cut or remove the scar sufficiently to allow the remaining skin and tissue to return to their normal positions. Unless this is done thoroughly, often to over-correction, the operation cannot be completely successful. In old standing cases osteoplastic resections, joint stretching or tendon lengthening may be necessary adjuncts to simple scar excision.

After the scar is excised and the neighboring parts are replaced, then the resulting raw surface is to be covered with epithelium. This may be done by means of a Thiersch graft, a full thickness skin graft, or a sliding or pedicle flap. The choice will depend upon several factors: the Thiersch graft is the most easily applied, gives poorest cosmetic results and in healing contracts more than the full thickness graft or flap. A successful full thickness skin graft will contract about one-fifth or one-half its area. It is an excellent substitute for the destroyed skin except that it will usually tan to a greater or less degree. In a clean field where skin alone is desired and some tanning is not objectionable the full thickness skin graft is the material of choice. Where a subcutaneous fat pad as well as skin is required a flap graft is selected. Where applicable to the hand the full thickness skin graft has its advantage over abdominal flaps: the hand can be splinted in any desired position of over-correction while the skin graft is uniting. It is sometimes desirable to combine these two meth

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*From the Surgical Department of the Washington University Medical School, St. Louis, Mo.

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ods. The flap graft is thicker than the full thickness skin graft, carries some

Fig. a Fig. b

Figs. a and b. Case showing an ear characteristically crumpled as a result of a burn. The deformity is due to loss of skin on the anterior surface and to partial loss of cartilage at the border, greatest at the helix. The helix was pieced out as was also the anterior surface of the ear, between the antihelix and the posterior border, by pedicle flaps raised from the hairless skin behind and above the attachment of the ear. b. does not show the finished stage. Part of the redundant helix flap will be removed at a future operation.

subcutaneous tissue and does not tan abnormally. It may be placed in a field that is not absolutely clean. These special qualities influence the selection of the material to be used in the particular case.

The grafts or flaps are cut according to tin foil patterns made either from the raw surface directly or from a previously made reconstruction on a plaster cast and are either sutured in place or supported on forms or both. The Thiersch graft is best supported on a wax form or on sections of fine marine sponges.

Thiersch grafts are usually best obtained from the thigh, but if cut too thick will subsequently grow hair. For full thickness grafts the available skin that most closely resembles that to be replaced is used, while flaps are obtained from some neighboring site or are transferred as "jump" flaps on the hand or forearm. It should be kept in mind that the nearer the source of the graft is to the defect to be filled, the more closely will it resemble the skin for which it substitutes. When very thin or long flaps are used, delayed transplantation will insure their vitality. It is in growing children that the full thickness skin graft takes most kindly and gives best average results. On these children more and more are we using full thickness skin grafts where formerly we used flap grafts. It would be a great help if we could get the skin from the mother in some of these cases, but our experience is that while at first the homo-graft "takes" beautifully, after two weeks it begins to necrose and is slowly lost. This even when the blood "matches." Before finally giving up this plan, I am going to try the suggestion of Dr. Montrose Bur-

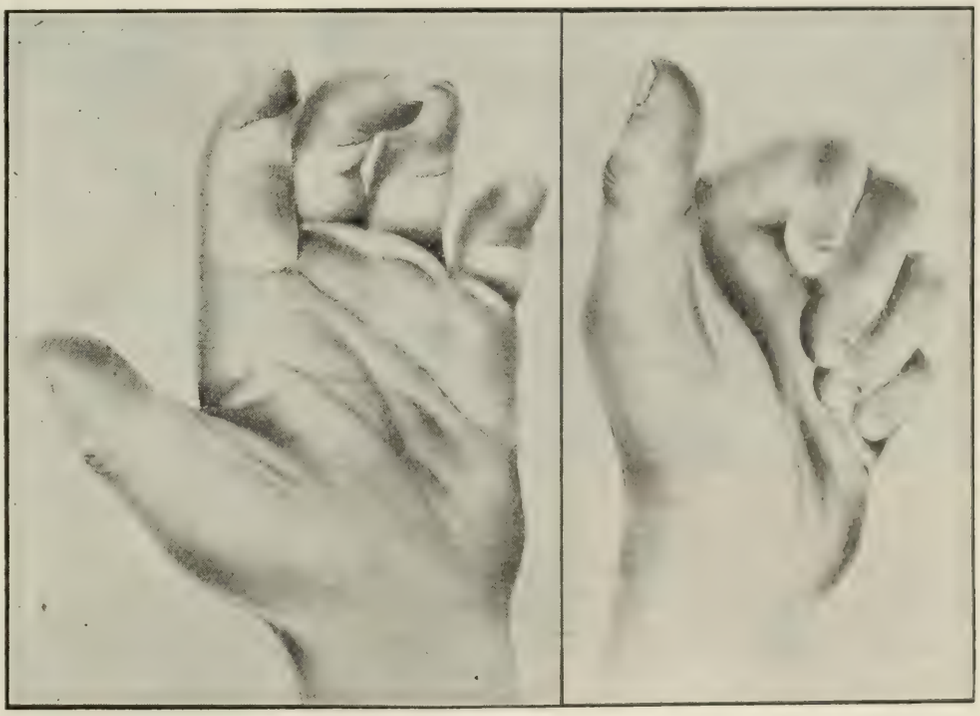


Fig. d Fig. c

Figs. c and d. c shows a nine-year-old child's hand from which most of the palmar skin was burned at the age of three years. At a previous operation the fingers were straightened out and a pedicle flap was transplanted from the abdomen to the raw surface on the palm, but the fingers have again contracted almost to the original condition. In this condition the fingers are not usable. d shows the result of a second operation by which the fingers were again freed and extended and full thickness skin grafts were applied to the raw surfaces. The fingers and hand were held extended on a splint during the healing period. In the picture the skin grafts show lighter in color than the abdominal flap. Though the fingers cannot now be fully extended, they are, in their present condition, usable and mobility will increase with use.

Fig. e Fig. f

Figs. e and f. Eversion of the upper lid with complete fixation of the lid to the brow resulting from a burn received in early infancy. The correction was made by a Thiersch graft applied over a wax form—"Gillies' outlay graft." f shows ability to close the eyelids. This picture was taken two years after the operation just described.

rows and take the skin from a donor of about the same age as the recipient.

In treating an ectropion of the mucosa of the lids or lips, the stent or outlay graft, "Gillies" modification of the Esser graft, is ordinarily most effective. Ectropion of the nostrils is easiest corrected by making a transverse incision across the dorsum of the nose, sliding down the tissues and filling the defect with a full thickness graft.

Fig. g Fig. h

Figs. g and h. Ectropion of the upper and lower lips with inability completely to close, resulting from a burn received in childhood. The correction was made by a technic similar to that used for Case e and f. This was followed by a second operation for the adjustment of the vermilion border. The point of the chin has since been brought forward by a cartilage insert.

The eyebrows may be well imitated by a full thickness graft taken from the scalp behind the ear. If the graft takes perfectly, the hair will grow naturally. If there is a slight surpeficial loss of the graft, the hair will be fuzzy and if the full thickness of the epithelial layer of the graft dies, the hair will fail to grow.

Burnt ears must be unfolded and the defect covered with flaps or full thickness grafts.

In using full thickness grafts on the palm of the hand or finger it is well to make the raw surface and the graft larger than the original defect by undermining the bordering skin and turning it outward in flap form. This allows for contraction.

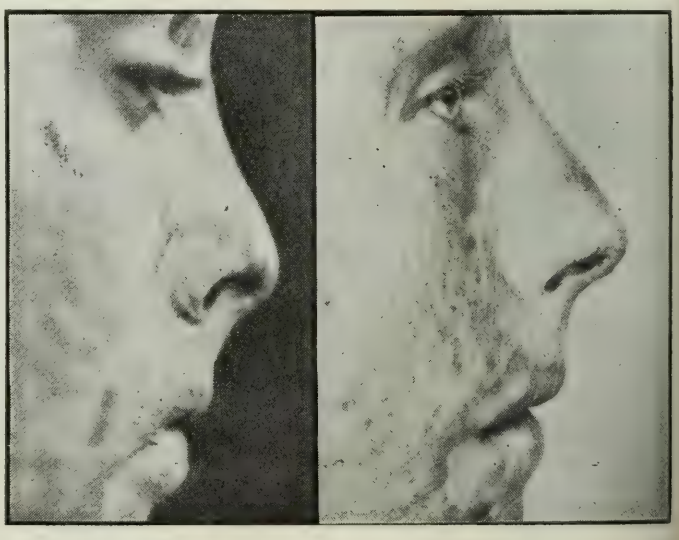


Fig. i Fig. j

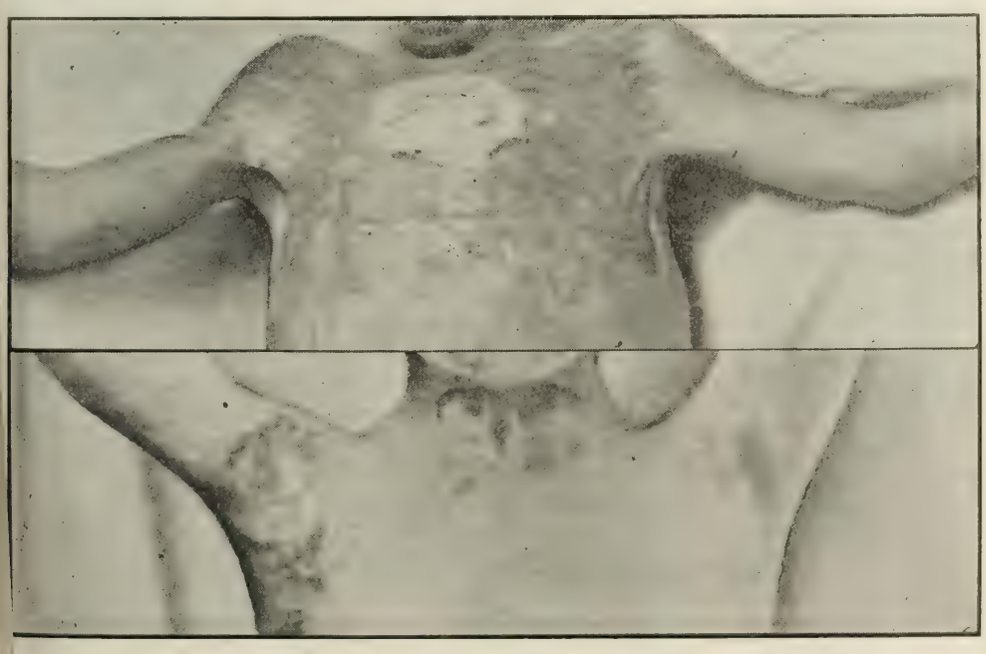
Figs. i and j. Eversion of the nostril and snubbing of the end of the nose due to destruction of the skin by a burn in early childhood. A transverse incision was made across the bridge from cheek to cheek at the level of the upper border of the alae. The skin with the subcutaneous tissue was undermined and pushed downward and the resulting defect was filled with a full thickness skin graft. The scarring on the cheek is rather accentuated in the second photograph. In a girl we might attempt to correct this by skin grafting.

The arm bound to the side, following an axillary burn, is released by incising the scar bands and the defect is filled by a full thickness skin graft or by pedicle flaps as best suits the particular case.

Any large area covered by full thickness skin grafts may require repeated grafting to compensate for partial loss of, or shrinkage, of the grafts.

Top: Fig. k. Bottom: Fig. l

Figs. k and l. k shows the absence of the outer two-thirds of each eyebrow due to burn at nine years of age. l shows replacement by a hair-bearing skin graft taken from behind the ear. The scar at the junction of the graft with the natural brow shows on each side. This could be avoided only by restoring the whole brow in one piece, but it is made inconspicuous by training the hair over the bare area. Following a successful scalp graft, the hair must be trimmed at stated intervals, but otherwise it is an excellent imitation of the natural brow.



Top: Fig. m. Bottom: Fig. o

Figs. m and o. o shows fixation of the arms by axillary scars. Released by cutting the scars, abducting the arms and covering each raw surface with a full thickness skin graft. One side was done at a time and the abducted position was maintained for about two weeks.

Changes in the scar, other than contraction, may call for its removal. Among these changes are indurations that might precede or have actually become cancerous and chronic infections. A simple thickening of the scar may be treated by "tincture of time," by shaving off the ridges and edges and Thiersch grafting, by the use of radium, by excision followed by a full thickness graft or by a sliding or a pedicle flap operation.

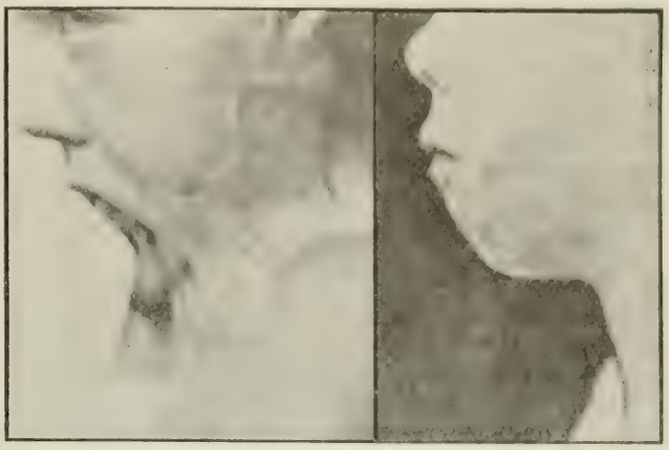


Fig. r Fig. s

Figs. r and s. r shows a union of the lower face tissues to the chest wall following a loss of the skin from the lower part of the face, front and sides of the neck and the upper half of the chest. In this instance the lower lip was attached to the front of the chest an inch below the upper border of the sternum. If this condition had been permitted to continue the lower jaw would have become distorted and the teeth everted. The correction shown in s was made by freeing the lip, chin and submaxillary tissues from the neck and chest by a transverse incision from ear to ear and covering the raw surface with full thickness skin grafts. On account of the subsequent contraction of the underlying scar the grafting was repeated several times, putting in a strip of skin 3 centimeters wide at each later operation.

By patience, persistence and good surgery these unfortunates can be greatly improved in comfort, appearance and function and as a general rule the earlier the restoration is undertaken the better will be the result; although I have operated upon such cases fifty or sixty years after they were burned.

DISCUSSION

Dr. J. Shelton Horsley, Richmond, Va.—Dr. Blair's work is so excellent that it is difficult even at the expense of boring him not to

begin the discussion of his presentation with an expression of sincere admiration. Those of us who have been sufficiently fortunate to see him work in his own place and know the infinite pains he takes can readily understand why he gets such good results.

I am delighted to hear emphasized the points concerning isografts and autografts. There has been much spectacular surgery that had no basis in biological principles in which a child's face was covered with skin from the pig's belly. Newspapers have become cognizant of it and have made a wonderful thing of it. They do not follow up to see if it sloughs off later and does not take. As Dr. Blair says, at times autografts will not take under the best conditions. We can get results in various ways, and one is by preventing contraction by traction. A little rubber band placed in the line of supposed contraction and kept constantly in place will work wonders. I think the dentists have taught us much in regard to this little rubber band which will bring the alveolar structure in position when seemingly nothing but a mallet and steel band would have any effect.

Where does the contraction after scars come from? In the bile duct bridges of connective tissue have been grafted in, supposing that if they are covered over with epithelium there would be no trouble. Strictures of the urethra are covered over with epithelial tissue. The contraction forms from the inner, lower, substratum, the dermis or corium, and when that has once occurred it is impossible to do away with it unless we cut it away. This contraction can be made less obvious by the various ingenious methods that are used, but it tends to recur just the same. The importance of this fact is great. In the thin tissues above the eye, where the corium is very thin, you can successfully utilize a Thiersch graft, but usually you have to transplant whole skin, preferably from some region of the face.

Another thing is that we must remember that contraction depends upon scar tissue and that depends upon many things, among others infection and lack of nutrition. If the nutrition is cut down, the highly differentiated cells cannot live and you find excessive scar tissue. Dr. Gessner, of New Orleans, has done some excellent work in that way on the testicle. He found that if the blood supply is too much diminished in a testicle, the testicle may not slough, but the parenchyma cannot live and the testicle becomes a mass of scar tissue. And poor nutrition invites infection.

Dr. Frank K. Boland, Atlanta, Ga.—Dr. Blair stated recently that when one of his patients became sick he sent for a doctor. His work is not with sick people, but entirely with plastic surgery.

Something should be said about prophylaxis against the bad deformities. If the cases were handled differently sometimes in their initial treatment the deformity might not be so bad and might not require such extensive operations later. The first thought in these cases always is to preserve life. The children come in a condition of shock. If they could be handled to prevent deformities by proper splinting and separation of fingers and toes, oftentimes the deformity would not be so marked. They are usually handled at first by general practitioners, but it would be well if the plastic surgeon could have something to say about the first handling. I think the necessity for such extensive plastic surgery might not be so great under those conditions.

Dr. Joseph E. Johnson, Memphis, Tenn.—Dr. Blair spoke of putting on the Thiersch graft in the earlier stages of burns of the face, which is an excellent idea for several reasons. The granulation tissue is what eventually makes our scar tissue, but, as we know, in any wound cicatrization does not begin until the twelfth day. Granulation tissue occurring in the presence of infection is what makes these scars that later destroy the face. It is remarkable that if you stretch the face gradually as the dentist does you can stretch it to almost any extent. Where the deeper structures are involved and have been allowed to cicatrize, contraction follows. By putting on the Thiersch graft first, this graft will not contract as does the scar tissue and you will not have the formation of such a large scar. The Thiersch grafts have practically no place in the face, for they are inelastic. We must have a flap graft or a whole skin graft.

In the mouth if the deeper structures are not involved and we cut the tissues loose, the muscles go back into expression and pull these into place. If there is no destruction of the seventh nerve you can stretch back almost any face into shape.

In the handling of the scar the ambrozene treatment seems to clean them up more rapidly than anything else. We have another method of getting skin instead of taking it from the abdomen or the prepuce where we want thin skin for use around the eyes. Skin from the prepuce will tan very easily. I recently used this around the eye, but had to remove it because of the marked tanning.

The Thiersch graft on the hands has not been satisfactory. I recently had a case of a rope burn of the hand. I made a flap on the back, like glove fingers, put a drain in under the hand, and left this on for twelve days, to the time cicatrization began. I then cut through the end of this and left it until it adhered on the sides. I think better results resulted than if the flap had been left and divided later. This man could move his fingers at the end of twelve days and put his hand in his pocket.

Dr. Hermann B. Gessner, New Orleans, La.—I wish Dr. Blair, in closing, would give us the details of how his whole thickness grafts are made. My own experience with these grafts has been unsuccessful. The only whole thickness grafts I have used with satisfaction have been of the type described by Dr. J. S. Davis in his book on plastic surgery, perforated with the scalpel in a number of slits.

Dr. Blair (closing).—A Thiersch graft will contract very greatly, but it has a distinct place in the repair of the face if you allow for this contraction. On the eyelid and on the lip the subcutaneous muscles are normally closely attached to the skin, a condition more easily reproduced with the Thiersch graft than in any other way. For ectropion of the lip or lid the raw surface is made three times the ultimate size desired, and the Thiersch graft is draped over a wax form of corresponding size. The graft covered form is held against the raw surface by the tissues being sutured snugly around it. By undermining the skin the raw surface can be made any size desired and thus the contraction may be allowed for. We have not been able to control or foretell the ultimate color of these grafts. They may be too white or they may be tanned.

Dr. Johnson brought out one of the most important things about the face. If you will release the muscles of expression they will go to their proper place. This accounts for the postoperative improvement usually seen in operations for facial defects and deformities.

The whole thickness skin graft is like the little girl who had a little curl—"when she was good she was very, very good, and when she was bad she was horrid." It is surgically possible to transplant whole thickness skin grafts and get nearly perfect results in the majority of cases, but we have failed in all possible conditions. If you cut the graft exactly the size of the space it is to go into, within twenty-four hours it will have an active blood supply. If you cut into it with a knife it will bleed arterial blood freely. It is easy to get the supply, but unless you limit it or provide drainage, by the end of a week much or most of the graft may have choked to death from engorgement. At first we tried to get rid of the engorgement by sacrificing and using packs of citrate of soda to keep up the bleeding. Our final solution—and it is proving more or less successful—is even pressure. We use a fine marine sponge wrung out as dry as possible and applied under bandage pressure, over xeroform ointment gauze. At the end of one, two or three weeks, depending upon how you feel about it, the dressing is removed and the graft examined. If you are sure it is clean two weeks is better; if doubtful about the cleanliness one week is best. If the tension has been just right it will not have choked to death with blood nor will it have died of ischemia. There is still one more complication to guard against. The lack of vasomotor control is apt to raise vesicles in the second or third week and then the trouble starts. These may become infected from bacteria within the skin and unless controlled much of the graft may even now be destroyed. I have found that painting the desquamated surface with 1 per cent aquaous solution of silver nitrate once a day tends to control these inroads.

By following the above three rules we are succeeding with a large percentage of our full thickness skin grafts.

PRESENT DAY OBSTETRICAL PROCEDURE*

By T. S. Field, M. D.,
Jacksonville, Fla.

Obstetrics is the branch of medicine, in the practice of which the physician becomes the subject of more unjust criticism and the object of more undeserved praise than in any other branch. In addition, he is the recipient of fees more widely at variance with the services rendered than in any other line of endeavor.

The reasons for the truths stated in the above sentence are mainly two: first, custom, for obstetrics has ever been considered a very natural physiological function attended with little risk, and the accoucheur has, from time immemorial, received small recompense for his labors; second, the fact that, with the exception of a very limited number of specialists in other lines, everybody does obstetrics of one kind or another. Because the general public has no adequate method of choosing intelligently between an obstetrician and a doctor who delivers babies, these facts make for keen competition in securing patients and result in the reduction of fees. The patient who feels that $500 is a reasonable fee for the removal of his acute appendix would have convulsions upon the receipt of a bill for $150 for the delivery, prenatal and postnatal care of his wife, and yet the obstetrical procedure carries a double responsibility and frequently calls for much more competent judgment and skill, not to speak of the time and labor involved.

The most difficult feature of obstetrics is the heavy sense of responsibility which the obstetrician bears. It often is the deciding factor which warps our judgment. After a highly nervous woman has been in labor for several hours, begging for relief, and the anxious husband or mother is constantly importuning us to do something for her, that sense of responsibility for the life of the unborn child will inject itself into the harassed mind of the obstetrician and perhaps be the deciding factor

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between giving nature her full chance and interfering. Someone has said:

"Without responsibility there can be no efficiency, and without efficiency success can only be accidental."

Newell, in his monograph on "Cesarean Section," has correctly paragraphed the modern practice of midwifery in the hands of the general practitioner. He says:

"As obstetrics is ordinarily practiced it is assumed that every pregnant woman is a good risk for child birth until symptoms arise which call for special treatment, and these symptoms are often not appreciated until it is too late for a satisfactory result to be obtained. For the best good of our patients every woman should be looked upon as abnormal for childbearing until a painstaking examination proves that her interests will not suffer if she does not receive special care. Then, and only then, should she be treated as a routine case."

A physician who does obstetrics without bearing in mind the many dangers attendant upon pregnancy and delivery, and who accepts cases for delivery without preliminary examination to determine the patient's physical fitness both to carry and deliver the child, has no sense of responsibility. The doctor who accepts a patient for delivery upon her statement of pregnancy and dates and then forgets her until he is called to her in labor ought to be a relic of the dark ages, but, unfortunately, he is ever with us.

It is a sad commentary upon our progress to note that the still birth percentage still stands at the same old 5 per cent that we were taught in school; that the number of deaths from post partum sepsis still continues to average over 20,000 annually in the registration area in this country, and that we are still in the dark as to the cause, and ofttimes widely at variance in the treatment, of the toxemias of pregnancy.

We have made progress in many lines of obstetrical procedure. The carbohydrate diet regime in the early toxemias has produced really remarkable results. Pre- and post-natal care has come to the fore, reducing the maternal mortality and morbidity to a remarkable degree. Cesarean section has been perfected. But the fact that we are still floundering around is evidenced by the attempts to introduce innovations in obstetrical practice.

The physician is doing his best to make labor painless, or as nearly so as possible, in an endeavor to induce women to have at least one, if not more children. Patients are clamoring for painless labors. One of the first questions asked by a woman presenting herself for her preliminary examination is, "Doctor, do you give gas?" If not, she seeks a painless obstetrician elsewhere. This propaganda has led us from the few whiffs of chloroform as the head comes through the introitus, to the Potter version. Dr. Potter, himself an exceedingly clever operator, is leading many of us who are not so well equipped into serious difficulties in our endeavor to help suffering womanhood.

The requisites of a good obstetrician are: a sound knowledge of the principles and mechanics of obstetrics, common sense, good judgment, and last, but by no means least, patience. With this equipment he will not be rushed or pushed into unnecessary procedures to shorten a natural labor. Infant mortality and morbidity will be reduced to a minimum, and he will practice as nearly as possible ideal obstetrics.

What is the ideal to which we aspire? It is to bring a healthy mother up to the ordeal of labor in the best possible shape to go through it safely; to deliver her as painlessly as possible with due regard to the life of the child and her own soft tissues; to send back to her position in the world a woman fitted to perform her duties; and to bring into the world a healthy child fitted for the struggle for existence.

To attain these ends we must have a perfect knowledge of our patient from the start. When a patient presents herself to the physician in the early stages of pregnancy it is his duty to discover, if possible, first, whether his patient will be able to carry her child to term or not; second, whether she will be able to deliver it normally at term, and third, whether she will have a healthy baby.

A general physical examination then is our first step. Hunt for foci of infection as a cause of toxemias. Make a blood pressure and urine record for future reference. A routine Wassermann will ofttimes surprise you. A careful history, with special reference to previous labors in a multipara and menstrual history in both multiparae and primiparae, is an essential. With these points especially stressed, the

examination proceeds like any general physical examination, from head to foot. In addition we measure the pregnant woman very carefully, that we may properly prognosticate the difficulty or ease of the passage of the fetal ovoid during labor. This original examination permits the physician to put his patient in the best possible physical shape to carry her baby. We treat the unborn baby through the placental circulation for syphilis, should the mother's blood be found positive. In this connection permit me to state that because the mother's blood is negative you have not ruled out that factor until you have also examined the father's blood. This should be resorted to in suspected cases.

We must prepare in advance for a premature induction of labor in a contracted pelvis, or prepare the family for the application of forceps or section.

The patient is then instructed as to diet, care of the teeth and nipples, exercise to keep the muscles in good shape for the labor, and the necessity of routine urine examinations and blood pressure readings. I take a good deal of time explaining to new patients just why I require these examinations, and I find that, with very few exceptions, they are ready and willing to come to the office for them and appreciate this attention. An elaborated typewritten copy of these verbal instructions is then given the patient to take home and peruse. On this sheet in heavy black type are warnings against a diet high in proteins and the warning signs of toxemia.

My experience has been that the vomiting of pregnancy is more in text books than in fact. When I find a patient vomiting I look first for a high protein diet with consequent intestinal toxemia, then for a focus of infection. The teeth are often offenders. I have seen a case of persistent vomiting cured by the removal of one abscessed tooth. Pyelitis is far more frequent in pregnancy than one would naturally expect and is a complication often overlooked by the general practitioner. It is a frequent cause of vomiting in the early months.

Our knowledge of the toxemias of pregnancy is largely theoretical. Kosmak calls eclampsia the disease of theories. We have a large number to choose from and almost as many remedies as there are theories. It is not my intention to discuss eclampsia, but I do wish to say that the term is a misnomer. It was so named because it came on "in a flash." It does not. There is plenty of warning, if you are on the lookout for the impending signs. It is my purpose to bring to your attention the fact that we are warned of the approach of this dreaded complication, and it is our business to read those signs correctly and institute treatment to avert this disaster. The aim of our prenatal care should be the averting of disastrous complications. Forewarned is forearmed.

A routine physical examination at the seventh month is invaluable. It is a complete check on the first examination. One picks up details missed in the first examination and has more definite knowledge of how the maternal organism is carrying its burden. At this time it is often possible to discover a breech, and by watching the patient carefully until term convert it into a vertex and deliver it as such. I have converted and delivered no less than three in the past two months. My experiences with breeches, particularly in primipara, has made me doubly careful in hunting them out prior to delivery and converting them by external podalic version, which is an extremely simple procedure in most cases. I heard one obstetrician make the statement that he made it a rule to do a cesarean section on all breech cases. I do not, but I do make it a rule to discover them prior to labor and convert them if possible. This rule has saved me much trouble, many lacerations, and has cut down my stillbirth mortality, not to speak of saving the mother these same and many other troubles.

At the time of the original examination, all mothers are told that they will be expected to go to the hospital. I consider obstetrics a surgical procedure, and I face a delivery in the home with the same trepidation that I face a surgical operation in a private home. Economically, the average patient is better off in a hospital. She can get a private room for $25 a week. The use of the delivery room adds $5 to the first week, which is made up by allowing her to go home on the eleventh day.

I frequently send my patients to the hospital for the delivery and send them home in an ambulance the following day, in cases of mothers with other children for whom there is no one at home to care, rather than deliver them in the house.

When the patient is in labor I seldom make a vaginal examination, and only then for cause. I am not curious about the stage of dilatation or rotation unless the labor is protracted. The patient is shaved as for any vaginal operation. Iodin preparation is used entirely. I would much rather do a perineorrhaphy with the usual obstetrical preparation than deliver a woman without the usual perineorrhaphy preparation.

The patient's and baby's condition can best be judged by their circulation, and it is a mistake to hasten a labor when the maternal heart rate is not accelerated, unless the baby shows signs of pressure by an acceleration or slowing of its heart beat. Many a mother suffers from a chronic endocervicitis due to the manual dilatation of the cervix to hasten labor or the use of pituitrin before the cervix is fully dilated. I am personally acquainted with eight babies who are idiots from an injury directly traceable to the use of pituitrin. I seldom use pituitrin. When I do use it, it is for inertia uteri, with the head on the perineum and the cervix fully dilated, in a multipara. When given, the dose is never larger than three minims. It has been my experience that if pituitrin is going to be of service three minims will do the required work.

I make it a rule to catheterize all patients as soon as they are draped for delivery. I believe that I may save my patients from a submucous laceration of the prevesical fascia and utero-vesical ligaments, with resultant cystocele, by this rule.

Patients who are suffering are given gas or ether throughout the painful part of the second stage with the pains. I have never seen any ill effects from this yet.

Immediately upon birth the baby's mouth is cleansed of mucus. He is then greased with sterile vaseline while the cord is still pulsating. When pulsation ceases the cord is tied and cut and a sterile dressing applied which does not have to be removed until the baby is ready to be bathed. By greasing and wiping off the baby at this time no time is wasted and the baby is not subjected to an oiling by the nurse when she finds time, at which time he is usually unnecessarily exposed. And the cord dressing has one handling cut out, which eliminates one chance of infection to the cord.

The cord tied, dressing and binder applied, silver is put into the baby's eyes and he is turned over to the nurse. The mother is then inspected for lacerations of the cervix and perineum, and if any are found these are repaired at this time, before the delivery of the placenta. In cases where episiotomy is necessary it is my practice to place at least one suture in the perineum before the episiotomy is done. The ends are clamped and the proper restoration of the parts is assured by this procedure.

Sufficient time will usually have elapsed by this time to allow the placenta to separate, and if it does not expel itself within twenty minutes the uterus is gently kneaded. No force is ever used, as this often causes tearing of the placental villi and retention of bits in the uterus. We all know that the best safeguard against sepsis is an empty uterus.

Ergot is not given routinely. There is as much excuse for giving ergot routinely as there is for taking out life insurance every time one rides upon a train, and no more. This is one of the many customs which have been handed down from time immemorial, and is a pregnant illustration of the lack of rapid progress in obstetrical thinking.

Post partum, the patient is allowed to move in any position. The bed is usually raised during a part of every day to insure drainage. She is given soft diet at once if she is not nauseated and regular diet within forty-eight hours in normal cases. The baby is put to the breast every two hours from the start until the milk comes in, for the effect upon the involution of the uterus and to stimulate the breasts as well. If uncomfortable from inability to void she is catheterized, and if she had severe after-pains she is given a narcotic if necessary. She is allowed to sit up in bed from the fourth or fifth day on, corresponding to her condition. The average patient is

allowed out of bed on the tenth day and allowed to go home on the eleventh after a vaginal examination. If the uterus is found retrodisplaced a pessary (Albert-Smith) is inserted as soon as the lochia has ceased.

All patients are required to come to the office for a routine discharge examination in the sixth week, at which time their general physical condition is checked. The baby is looked over. A vaginal examination is made, and any defect that is correctable by office treatment is corrected. This includes raw areas left from lacerations, anal fissures, granulating areas on the cervix, and insertion of a pessary for retrodisplacements. The patient is told of any defects and advised how to remedy or have them remedied.

This is my idea of the minimum requirement in the ideal handling of an obstetrical case. My idea in this paper is to suggest that we standardize the handling of obstetrical cases along these lines and educate the general public to differentiate between the man who is doing his work well and the one who is handling his obstetrical cases by guess and by luck. When we can educate the public up to the point of expecting this we shall effectively reduce maternal and fetal mortality and morbidity, and not until then.

DISCUSSION

Dr. Robert B. McIver, Jacksonville, Fla.—To my mind this resume of Dr. Field's may be taken up under two heads: first, that prenatal care requires the accomplishments of the careful internist; and second, that delivery often calls forth sound surgical judgment. Prenatal care is dependent upon careful preliminary examination, and treating obstetrics as a surgical procedure not only brings out the qualities of the surgeon as far as technic is concerned, but, more important, it develops surgical judgment.

In the service we have had together in Jacksonville the procedure he has outlined has been carried out in so far as possible. Of course, in a charity service, cases are admitted that we have not seen beforehand. Many cases have had no history taken, no urinalysis, and no blood pressure reading. The damage is already done. However, from the time they come into the hospital until they go out, a careful routine is followed, and it is surprising how infrequently it becomes necessary to resort to radical obstetrical procedures.

Dr. Thos. B. Sellers, New Orleans, La.—Dr. Field stated that he only delivered women in a hospital. The sending of all cases to hospitals is convenient, and personally I prefer it, yet I do not think the obstetrician should limit himself to hospital practice, especially with multiparae. So many women object to going to the hospital and many of our obstetricians refuse to deliver the case in the home; consequently they are forced to get other doctors who are not so well equipped. It is more convenient and possibly preferable, from a surgeon's viewpoint, in a hospital, but surely we can equip a home to handle a case with a fair degree of ease and safety to both mother and child, if the patient demands a home delivery.

I would like to know at what time Dr. Field rotates his abnormal presentations.

I am a strong advocate of the use of nitrous oxid, oxygen analgesia and anesthesia in obstetrics. I have used McKessen's self-administering apparatus for the past two and one-half years, and it has solved the anesthetic problem for me. I usually give morphin the latter part of the first stage, and start the nitrous oxid when the pain becomes severe. I do not wait for full dilatation to start my anesthetic.

I am not an advocate of "twilight sleep."

Dr. James R. Garber, Birmingham, Ala.—The precautionary measures that Dr. Field brought out are extremely wholesome, but I was impressed with the contrast between this paper and Dr. Levy's discussion yesterday. Dr. Levy maintained that we find a good many abnormalities in our eagerness to do intensive prenatal care. I believe unless you can recognize the indices and give them their proper evaluation, there may be some error in this regard, but the man who is looking for such indices of trouble will err on the side of safety rather than neglect. It would be a worth-while lesson for the members to carry home, that we must be forever on the lookout for trouble.

A note of conservatism at the time of actual parturition is extremely valuable. One should never conduct a labor case according to the time equation. What does it matter if a case has been in labor forty-eight hours, provided the maternal and fetal conditions are satisfactory? I see no reason to resort to haste in such cases.

The next feature is the question of routine therapy in obstetrics. I heartily endorse his ideas with reference to ergot and pituitrin. The more I resort to these drugs the less merit I find in them. The most important thing about ergot is that the nurse will take it for granted that because a patient has had ergot she can neglect her the first three or four hours post partum and not give the attention that is so important.

Dr. W. G. Bogart, Chattanooga, Tenn.—We must be careful about advising our patients to go to a hospital, for we may put them in the hands of those who are not able to take care of them. I am sure, however, that we should require just as much at the hands of our patients and of our attendants as the surgeons do. We must put it on a high surgical basis. The surgeon, as a rule, has only one life at stake, while we have two, and for that reason it is more important that our standards be as high and the skill demanded as great.

As far as trying to force our patients to go to the hospital is concerned, we cannot do it if we try.

I would like to ask Dr. Sellers when he begins his anesthetic, in the first stage or the second.

Dr. George F. Pendleton, Kansas City, Mo.—Dr. Field is a man after my own heart, safe, sane and logical. I wish to ask him his particular reason for doing as he does. For instance, the baby is born, and there is a waiting of four to six minutes while the blood is passing from the placenta. He waits and cuts the cord and then inspects the vulva. It seems to me he is wasting time under heavy anesthesia. For that reason as soon as the baby is born I let it lie on its right side, cover it up, and then inspect the vulva. If I need to do any repair, I start right in there. Sometimes you are through the repair by the time the cord is cut. It saves a few minutes.

The second point is the question of allowing the patient to sit up in bed in five days. Surgically, that is a good point. Fundamentally, the quicker you get the patient up and get her to eating, the better off she is. But to go back to a little anatomy, this uterus not pregnant weighs about two ounces and it is held up by small ligaments. Dr. Reder told us yesterday that in the first few months of pregnancy he puts in a pessary to help hold up the added weight in the uterus. By and by the uterus swells up and the baby lies on the inlet and holds the uterus up and there is no weight on the ligaments. Then the baby is suddenly delivered, the uterus shrivels down. At full term it weighs two pounds. It takes at least ten or twelve days for this uterus to come down into shape anywhere near its original two ounces. At the end of five days the uterus is still heavy, and if you allow the patient to sit up the uterus sinks down into the pelvis and pulls on these small ligaments. I am coming more and more to feel that the so-called "female" diseases do not all come at the time of delivery. They come in the after-treatment of our patients. I keep my patients flat in bed and mostly on their sides and abdomen until the red is out of the discharge. I know then the uterus is pretty well involuted. Then I begin to allow them to sit up. I believe women get on their feet too soon. They go back to work too soon. If you keep them flat on the back an even two weeks, and gradually begin to let them up, the small ligaments will be protected and much of the so-called female trouble will be avoided.

Dr. Field (closing).—Being primarily a gynecologist and having three services in hospitals in Jacksonville, I make it a rule never to do house obstetrics. I can do these cases much more easily at the hospital, and it saves time. I believe that in a majority of instances obstetrics is a surgical procedure, and while Crile can operate in a bedroom, and I have done a laparotomy in a private house in the early days in Florida, nevertheless I do not do it from choice.

I rotate a breech in the last two weeks. If I find a patient with a breech presentation in routine examination about the seventh month, I have her come back at the middle of the eighth month and then do a rotation. Often the child will rotate itself, so I do not bother to rotate a breech at the seventh month.

I believe that the self-administration of nitrous oxid is a fairly safe procedure in a hospital where you have an oxygen tank; but I am decidedly against it in the home where you have an apparatus without an oxygen tank. You can pick up a paper almost any day and see where a dentist killed a patient in the office with nitrous oxid. It is an unsafe procedure.

We all have had patients who were in apparently perfect health, and yet they had a bad time at delivery. If you cannot judge a normal woman, how can you judge an abnormal one, if you do not watch her enough to pick out the abnormalities in the first place?

The trouble I find with ergot is when it is given routinely without orders.

The stage for anesthesia depends upon the patient. Some patients have practically no pain and do not require an anesthetic; some are hysterical and require it early.

My patients are never under an anesthetic after the head passes the perineum. I have the baby greased and wiped off while the cord is pulsating, then apply the dressing, which obviates the necessity of the nurse's taking the baby into a room with lower temperature or near an open window to grease it or bathe it.

As to getting the patient up early, that has been the result of my observations as a gynecologist. I find there are plenty of uteri that are heavy that are held up well in position with the patient walking around. One factor in maintaining the position of the uterus is intra-abdominal pressure on its posterior face. When that pressure is there the uterus cannot get out of position. Retroversion is usually caused either by wasting disease or by relaxed perineal outlet. If the vaginal wall is intact posteriorly and the ligaments are in shape it is better to get the patient up early, both for drainage and because exercise helps the involution.

ILEO-RECTO-VESICAL-FISTULA, PROBABLY OF LUETIC ORIGIN

By Edgar G. Ballenger, M.D., F.A.C.S.,
Visiting Urologist,
and
William Randolph Smith, A.B., M.D.,
Resident Surgeon, Department of Surgery,
Emory Division, Grady Hospital,
Atlanta, Ga.

The following history directs attention to an unusual condition, which the history and post mortem findings lead us to think was due to syphilis.

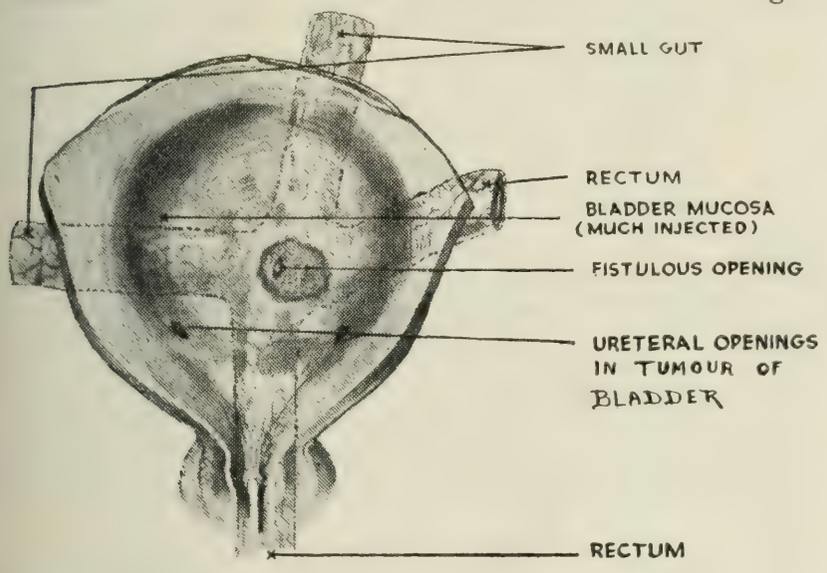
The specimen obtained at post mortem indicated that a gumma had formed on the bladder wall and surrounded a section of

intestine and the rectum. It must have undergone a necrotic change which permitted part of the gut to protrude into the bladder, where it opened. The growth was probably of considerable size, and under the influence of antispecific remedies became smaller. Unless it developed in this manner, it would be very difficult to explain the post mortem findings.

CASE REPORT

A negro, 38 years old, was admitted to the hospital November 7, 1922, complaining of an aching sensation in the penis after micturition.

Past History.—There was a sore on the penis three years previous to admission. He had been blind in the right eye since an injury five years previously. His bowels had been very irregular for several months. There had been a loss of about 15 pounds weight during the preceding four months.



SEMI-SCHEMATIC VIEW OF SPECIMEN

Present Illness.—The patient dated his trouble back about four weeks. At that time he had a sudden sharp pain in the left flank, which extended downward, finally becoming supra-pubic, where it remained as a dull aching sensation for about six hours, and gradually wore off entirely. From that time, however, he noted this aching sensation over his "bladder" for a short time following urination. Later this pain grew worse and was referred to the penis. On the morning of the day of admission he passed, per urethra, a substance which he thought was fluid feces and some blood mixed with his urine. After admission, his urine contained this same substance, which he described as fluid feces, but without blood. He passed urine three or four times at night and two or three times during the day.

Physical examination revealed a rather emaciated individual. There was an opacity in the right cornea. The teeth were in a very poor state of preservation and eight were missing. The anterior and posterior cervical lymph nodes were moderately enlarged. The chest was mildly emphysematous. There was a slight fullness in the iliac fossa, which appeared to be due to a dilated colon at that point. This region was slightly tender. The physical examination was otherwise negative.

Laboratory Findings.—The urine was foul smelling, cloudy and of a muddy color. It was alkaline, contained a trace of albumin, pus cells and many bacteria. These proved to be streptococci, staphylococci, colon bacilli and a large gram-positive bacillus.

Blood Count:

White blood cells	2,600
Polynmorphonuclear leucocytes	83%
Small lymphocytes	15%
Large lymphocytes	2%
Hemoglobin	70%
Wassermann reaction	++++

X-ray of the chest was negative.

An x-ray after a barium enema showed the large bowel irregularly filled with barium, due to a large accumulation of gas in the colon, but no evidence of a recto-vesical fistula.

Methylene blue injected per rectum did not appear in the urine.

Cystoscopic Examination.—He was cystoscoped first by one of the members of the staff, who reported a growth in the bladder.

Later he was again cystoscoped and this tumor was seen to be a non-encrusted, "beefy," non-papillomatous projection into the bladder. No fistulous opening could be detected, and the mass, which was about the size of a small English walnut, did not present the gross characteristics of a new growth. It suggested the possibility of gumma. The positive Wassermann previously mentioned supported this view.

Clinical Course.—The patient's temperature was normal and his pulse between 80 and 100 during his entire stay in the hospital. He was put on antiluetic treatment (arsphenamine and salicylate of mercury) and also was given urotropin. His condition remained much the same, though, for several weeks and he was more comfortable, and his urine showed a tendency to clear up. Later neutral acriflavin by mouth in three grain doses was tried three times a day, but without avail. He felt a little better, due probably to staying in bed. After about the fourth week he began to lose ground, gradually getting weaker and weaker until he died, seven weeks after admission. During the last two weeks of life there was a troublesome diarrhea, which had to be checked with opiates.

Autopsy Findings.—The only points of interest in the autopsy were in connection with his local condition. Just behind and at the upper posterior edge of the bladder, and slightly to the end of the midline, there was a hard mass from and into which ran loops of small gut, and the upper

end of the rectum. This mass was firmly attached to the external wall of the bladder and extended through it, presenting on the inner surface. There was a fistulous opening through this mass, which connected the bladder cavity with the loops of intestine.

Microscopic sections were made from four or five different points in this mass, but no evidence of new growth or tuberculosis could be found. The tissue presented the histologic picture of chronic inflammation, which led us to the assumption that the lesion probably was a gumma which had eventually broken through into the bladder at a weakened point. The hardness of the mass probably was due to a gumma plus the induration of the tissues in this region, which naturally responded, as would be expected, to the ever present sources of infection. At autopsy the patient presented evidence of arrested lesions of syphilis elsewhere.

A REVIEW OF SIX CASES OF MECKEL'S DIVERTICULUM WITH REFERENCE TO CAUTION IN RESECTIONS*

By R. M. Harbin, M.D., F.A.C.S.,
Rome, Ga.

During a fourteen year period ending October 1, 1922, there have occurred in our clinic 1813 abdominal operations in which the incidence of six cases (0.33%) of Meckel's diverticulum was observed. While in certain complicated cases this incidence may have escaped observation, it has been the rule in the main to search the lower ileum for this deformity. The condition, while comparatively rare, is attended in acute inflammatory cases by a high operative mortality because of certain difficulties of early diagnosis. Two of these cases were reported† in 1917 with reference to umbilical disorders of infancy. For the sake of brevity the bibliography of the subject will be omitted. The main point I wish to bring out in this discussion is a faulty technic in cases No. 2 and 3 that seemed to produce so much dysfunction that secondary operations became necessary. Because of the rarity of this abnormality the amount of clinical experience is not sufficient to warrant any standard technic of operations and these observations are offered for their face value.

It is rarely, if ever, possible to make a pre-operative diagnosis of the presence of a diverticulum, but there are characteristic symptoms which would mark a case as being an atypical acute abdomen.

Case 2 gave symptoms of ill defined intestinal disturbance and was only detected in the course of another operation.

Cases 1, 3 and 5 were diagnosed acute appendicitis and case 4, probably mesenteric thrombosis, while case 6 was treated for acute intestinal obstruction.

In the early course of an acute attack the mechanical symptoms of obstruction with a correspondingly lower grade of leucocytosis mark the case as one for critical study, because the great majority of cases of intestinal obstruction proceed directly or indirectly from the effect of peritonitis which would give a more definite history.

Case I.—A boy twelve and one-half years gave a history of abdominal pains since infancy. At four months old he had a pedicle excised from the umbilicus. He gave a history of one attack of colic one month previously. I saw him at 9:00 p. m. and again the next day. He had a leucocyte count of 13,800 and at 9:00 p. m. he was operated upon and the appearance of the diverticulum is shown in Figure 1. He has remained cured.

Case II.—Mrs. Blank, age 31, mother of 6 children, the youngest two and one-half years, was operated upon for uterine retroversion and relaxed vaginal outlet. Along with these troubles she had obscure intestinal disturbances with recurring attacks of constipation with inability to expel intestinal gases. A diverticulum was found fourteen inches from the ileo-cecal valve. It was ligated and excised (Figure 2) and inverted by a row of Lembert sutures at right angles to the course of the intestines. Convalescence was normal but intestinal disturbances became more pronounced with symptoms of violent colic after leaving the hospital and in six months she returned for a secondary operation. After opening the abdomen the upper limb of the intestine was found to be attached to the abdominal parietes. Notwithstanding the awkward shape of the site of the diverticulum it was thought that separation of the adhesion to the abdominal wall would give her relief. However, colicy disturbances continued and were occasionally attended by mucous diarrhea. Owing to certain domestic and neurotic troubles, the expectant treatment was adopted and in about four years the symptoms wore away through a sort of functional adjustment.

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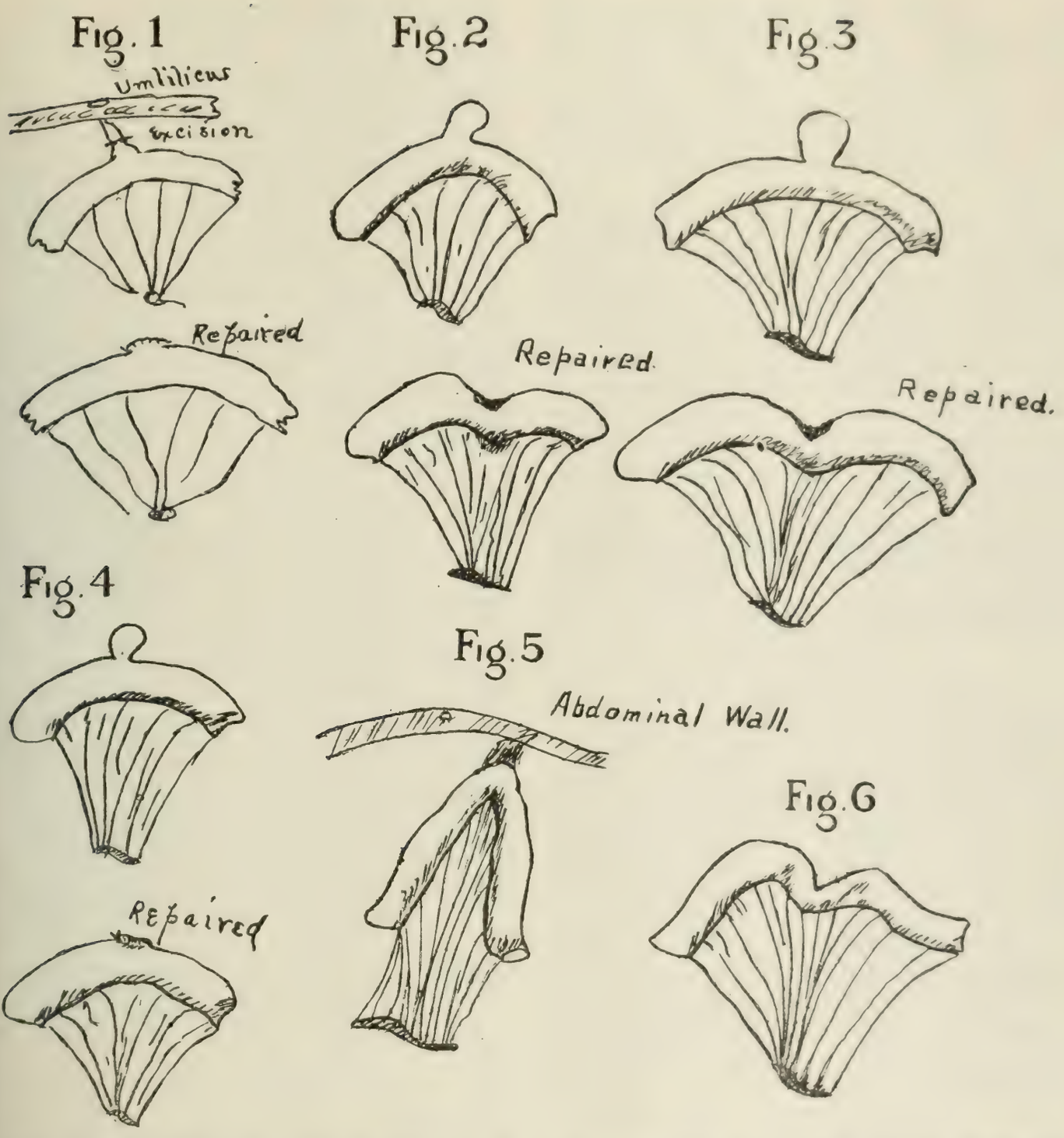
*Read in the Section on Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

†Harbin, R. M.: "Meckel's Diverticulum: With Special Reference to Umbilical Disorders of Infancy," Sou. Med. Jr., Vol. 10, No. 2, (February, 1917).



Case III.—A young man was referred to us with acute appendicitis. We concurred in the diagnosis, since the symptoms had lasted twenty-four hours with pain and vomiting and a leucocyte count of 10,000. The appendix showed only a slight degree of pathology and was removed. About twelve inches from the ileo-cecal valve a Meckel's diverticulum was discovered with the appearance of acute inflammation (Figure 3). Within forty-eight hours signs of acute intestinal obstruction developed which required resection of the gut with a side to side anastomosis. Since then he has had no trouble whatever.

Case IV.—A girl 17 years old was sent to the hospital by the attending physicians, having been sick thirty-two hours with agonizing pain and obstinate constipation. She vomited excessively, the urine was negative, leucocytosis 23,200, and abdomen massively distended more on the right side. Her general condition was critical. A tentative diagnosis of mesenteric thrombosis was made and when the abdomen was opened a pedunculated pouch five inches long was observed bound in a coil of gangrenous intestine producing a volvulus. Two and a half feet of ileum was resected but the patient died in twelve hours.

Case V.—A healthy pupil nurse nineteen years old was diagnosed as a case of subacute appendicitis. Only within the preceding year was there a history of slight abdominal pain and soreness, but for a week there were mild symp-

toms of distress with slight nausea. Urinalysis showed only a trace of albumin, while the leucocyte count was 8,700 and temperature and pulse were normal. Through a right rectus incision an atrophied appendix was removed and a Meckel's diverticulum three inches long was excised and repaired as indicated by Figure No. 5. Convalescence was prompt and a cure followed.

Case VI.—A three-year-old boy was referred to the hospital by the attending physician who had observed the vomitus as being fecal in appearance. He had suffered with abdominal distress for four days and vomited occasionally. His bowels had not acted in three days. He had an attack of vomiting seven months previously. The abdomen was much distended, the coils of intestines being apparent through the thin abdominal wall. Urinalysis was negative and the leucocyte count was 9,806. He had some of the appearances of gastro-intestinal toxemia and was held for observation for twelve hours at which time the diagnosis of acute intestinal obstruction was made. The leucocyte count remained unchanged. Through a midline incision there appeared a gangrenous Meckel's diverticulum the size of a hen egg (Figure 6) enwrapped by coils of intestines. The diverticulum was resected, and the patient died in twelve hours.

CONCLUSION

We have observed that adhesions which pull the periphery of the intestine to a more acute angle (Figure 6) do not necessarily interfere seriously with the function of peristalsis, but any slight angulation in the opposite direction with a narrowed lumen (Figure 7) has a more serious effect. This we believe happened in cases 2 and 3, and in resections of diverticulum having broad bases this should be borne in mind. Enough of the stump should be left to avoid this effect, and infolding Lembert sutures should be applied in a line parallel with the gut instead of at right angles.

DISCUSSION

Dr. J. Shelton Horsley, Richmond, Va.—There are a great many deaths from intestinal obstructions that occur as the result of Meckel's diverticulum. I do not see how it is possible to make anything more than a guess at its cause before operation, that is, as to a definite cause. Whenever you find a Meckel's diverticulum it should be removed, just as most of us remove the appendix in operating for other abdominal conditions. I have adopted a simple technic that makes it quite easy. By putting a lateral blood vessel clamp on the base of the diverticulum, it can be cut off and sutured over with catgut to control the bleeding and another row of linen sutures is placed over that. It does not take any longer to remove the appendix and it eliminates a decided source of danger.

One thing I would like to mention in regard to intestinal resection. Almost every case is adapted to end-to-end union. That is undoubtedly the physiological method if it can be used without too much danger of obstruction. A great many experimenters on dogs, one of whom I am, will tell you that you cannot produce obstruction by turning in too much diaphragm in the bowel of a dog. That is true, but not in the human being. I have had two patients die from turning in too much diaphragm. We must remember that the intestine in the human being is much weaker than in the dog. A dog can overcome almost any diaphragm, but a human being cannot.

There is a type of case in which you cannot satisfactorily do an end-to-end suture. The mesenteric space where the mesentery splits to envelop the bowel should, of course, be clamped off and sealed before the bowel is opened. If that is small and comes up as a narrow space there is no trouble in the end-to-end, particularly if each space is not approximated to the opposite space. Then a peritoneal covering will come over on each surface. But if you have a very large space it is very difficult to secure an end-to-end union. If you shove up these spaces into the lumen you may have obstruction. In this type of case I think it is best to close the ends and do a lateral anastomosis. While this is not physiologic it is safer than the end-to-end, where you have a fat mesentery and a small lumen.

Dr. G. T. Tyler, Greenville, S. C.—Several years ago, it was my fortune to attend the autopsies, at Blockley Hospital in Philadelphia, for part of the summer. In seventy autopsies, there were four cases where Meckel's diverticulum was found. I think that is the usual incidence. In none of these was there any connection between the diverticulum and the umbilicus. Another interesting point was that none of them was more than thirty-six inches above the ileo-cecal valve. The finding is frequent enough to make us be on the lookout for it and to examine the last yard of ileum when a laparotomy is done. If a diverticulum is found, removal is indicated, if it can be done without too much risk to the patient.

As to diagnosis, it is a question whether it can be made accurately when the patient comes with acute symptoms. The thing to do is to be on the out-look for it, and to treat it when we find it.

Dr. F. Webb Griffith, Asheville, N. C.—Last year I had two cases of Meckel's diverticulum. The first was in a child about 17 months old, who was brought in with all the symptoms of a general peritonitis. We naturally thought of a ruptured appendix. Operation revealed a normal appendix, but a ruptured diverticulum. After a stormy period of a week the patient recovered.

In the treatment of cases of diverticulum I am accustomed to put enterostomy clamps on the proximal and distal sides of the bowel, to cut off the diverticulum about a quarter of an inch from its base and then to suture it in the long axis of the bowel. In that way there is very little danger of obstruction.

Dr. Wm. T. Black, Memphis, Tenn.—The diverticula of which the author speaks are supposed to occur in about 2 per cent of people, usually within a short distance of the ileocecal valve, extending from the ileum. Diverticula are due to a failure of proper involution. In 98 per cent of people the omphalo-mesenteric duct is obliterated before birth, but in the remaining 2 per cent, parts of the duct remain and are present at birth. At times they remain patent throughout, and fecal matter comes through at the umbilical opening. In other cases they remain as a small cord, which is attached to the ileum and umbilicus. Where the diverticula are attached to the umbilicus, we find the most dangerous, as this is often attended with intestinal obstruction. The diverticulum assumes various shapes and sizes, but usually is smaller than the gut, and is open at the proximal end. These diverticula quite often concern the surgeon. In a great many cases of right sided pain a diverticulum is the cause. In all chronic cases of right sided pain a search should be made for a diverticulum. In fact, a search should be made in all chronic abdominal lesions, especially where sufficient pathology is not found at the time of operation to account for the symptoms present. Intestinal obstruction is frequently due to a Meckel's diverticulum. I have observed two such cases, and I have also previously reported two cases in which a tumor was growing from the distal end of a diverticulum. An x-ray barium picture will aid in making a diagnosis of the presence of a diverticulum. A diverticulum as a rule should be removed, but I have observed one case where the diverticulum's lumen was as large as the lumen of the ileum from which it sprang. Therefore, I did not see any reason for removing it. The fact that the feces in the ileum were liquid, and that the lumen of the diverticulum was as large as the lumen of the gut, and no peri-diverticular pathology was present, made me think it best not to remove this diverticulum.

PEPTIC ULCER AND ITS SURGICAL TREATMENT*

By M. J. Henry, M.D.,
Louisville, Ky.

Of all the pathological conditions to which the abdominal viscera are subject, none has been more widely discussed, or has more interesting features than peptic ulcer.

By the term "peptic ulcer" is meant any ulceration of the mucosa alone, or the mucosa and underlying layers of the wall of the stomach and first portion of the duodenum. Ulcers of the chronic type usually involve the deeper layers of the wall of the viscus. Ulcers of the stomach and duodenum are considered as one, because of the fact that their etiology, symptoms and treatment are very similar.

This is a disease of early adult life, by far the greatest number of cases occurring between the ages of 20 and 40. Males are much more frequently affected than females, the proportion being about three of the former to one of the latter. It was formerly thought that the reverse was true but in recent years more accurate methods of diagnosis have disproven this contention by eliminating many cases presenting symptoms suggestive of ulcer, but really reflex in origin, from disease of the pelvic viscera.

The factors underlying the development of peptic ulcer are, even to this date, rather obscure. Many theories as to its etiology have been advanced but none has received the uncontested support of the entire medical profession.

At present the most discussed theories are the hyperacidity, trophic and bacterial invasion theories.

The hyperacidity theory had many advocates at one time. However, the knowledge that chronic peptic ulcer could be coincident with achylia, and that many cases of marked hyperacidity did not show ulceration led many observers to look further in search of the cause.

In 1915, Durante[1] demonstrated that peptic ulcers could be experimentally produced by interfering with the nerve supply of the mucosa, which in turn altered the blood supply, thus decreasing nutrition and rendering the tissue more subject to the digestive action of the gastric juices. Bevan[2] cites three factors in the production of ulcer, saying that "gastric juice with its power of digesting devitalized tissue, plus an area of lowered resistance, resulting usually from some injury or lesion of the blood vessels of the mucous membrane, plus the lowered resisting power of the individual, equals ulcer." Brown[3] quotes the theory first advanced by Virchow, "that ulcers are produced by the digestion of a certain portion of the mucosa by the proteolytic enzyme of the stomach, or its destruction by the corroding effect of the hydrochloric acid."

Rosenow[4], in his work on the selective localization of streptococci, has explained the formation of peptic ulcer as

*Read in the Section on Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

being due to the hematogenous invasion of the submucosa by streptococci. After having so frequently found streptococci in the depths of ulcers excised at operation and having produced peptic ulcers in laboratory animals by the intravenous injections of cultures of streptococci, he concludes that these facts "constitute good evidence that streptococci are not merely accidental or secondary invaders of the tissues, but are commonly the original cause as well as an important factor preventing the healing of the ulcer." The great attention clinicians give to the eliminating of all foci of infection attests the seriousness with which they consider this theory.

The symptoms enumerated by one suffering from a peptic ulcer are usually of such a characteristic nature that many patients are said to present an "ulcer complex." Some, however, do not have such a uniform set of symptoms, and in these the diagnosis is sometimes difficult to make. They are said to have an irregular ulcer history, such a one as is frequently found in gastric complaints of reflex origin.

It may be said, with reasonable safety, that a gastric ulcer cannot be differentiated from a duodenal one by subjective symptoms alone. Graham[5], though stating many points in the analysis of the history, which influence the clinician in deciding as to the localization of an ulcer, says: "He who meets defeat again and again at attempts at ulcer localization, will in time, even when the symptoms have met most of his requirements, come to feel less sure of his diagnosis than is comforting."

The so-called ulcer history is one in which the patient states that he has pain in the epigastrium, coming from two to five hours after eating; coming in attacks lasting from a few days to several months; and relieved by taking food or alkalis. In varying frequency, to these symptoms are added: seasonal influence, sour eructations or regurgitations, vomiting, hematemesis, and the passage of tarry stools. All these may be present in one case, though usually one or more of them is not found. Peptic ulcers sometimes have very irregular histories, and this is especially true of gastric ulcers, chronic inflammation of the gall-bladder often leading to a diagnosis of ulcer. A case recently coming under the writer's observation very clearly demonstrates the irregularity of some histories of peptic ulcer.

This was a woman, 48 years of age, presenting a history of rather marked aching in the left upper quadrant; no food ease; some ease from whisky; occasional vomiting; and sometimes pain at night.

Physical examination was negative except for the presence of tenderness and rigidity in the left upper quadrant. The blood examination showed: hemoglobin, 96 (Dare); erythrocytes, 4,860,000; leucocytes, 16,700; polymorphonuclears, 74.5 per cent; and otherwise negative. Urinalysis was negative. X-ray of the gall-bladder and urinary tract was negative. X-ray of the stomach and duodenum showed a deformity of the duodenal cap. X-ray diagnosis, duodenal ulcer.

This patient was operated upon by Dr. Irvin Abell, and an ulcer with marked induration was found on the superior and posterior walls of the duodenum. A posterior gastro-jejunostomy was done. The stomach, left lobe of liver, spleen, left kidney and left diaphragm were negative to palpation. The gall-bladder was thin walled and showed cobweb-like adhesions to the omentum and transverse colon. The patient took the anesthetic poorly, and because of her condition the appendix was not examined.

The day following the operation the patient stated that she was more comfortable than she had been for months, and she has remained symptom-free since the operation, a period of four months.

A carefully taken history usually leads the clinician to a correct diagnosis in ulcers of the stomach or duodenum. However, it is to the laboratory that the diagnostician turns for support for his conclusions. Of the laboratory examinations which shed light upon this condition, the analysis of the gastric contents, and the roentgen examination are the more important, the latter being the most important.

The gastric analysis may show an hyperacidity, a retention of food particles from a Riegel meal, or the presence of blood, which are strong corroborative evidence of the presence of ulcer.

The x-ray very frequently gives positive evidence of the presence or absence of ulcer, and when present, oftentimes, accurate localization of the lesion. Carman[6] states that from July 1, 1918, to Jan. 1, 1919, 343 patients upon whom a

diagnosis of peptic ulcer has been made at the roentgen examination, were operated upon. At operation 333 showed the presence of peptic ulcer, a percentage of correct diagnosis of 98.21 per cent. Could any other method alone show such a high percentage of correctness? It is the writer's opinion that the x-ray is of value in the diagnosis of peptic ulcer, in inverse ratio to the knowledge the roentgenologist has of the other clinical aspects of the case he is studying. When the roentgen diagnostician knows nothing of the history of the case he can give an opinion based upon the x-ray examination alone, and this is of more value to the clinician who must correlate all the clinical and laboratory data.

For many years there has been a very wide divergence of opinion existing between the gastro-enterologist and the treatment indicated in these cases, the gastro-enterologist looking upon practically all of them as being amenable to medical treatment, and the surgeon feeling that the great majority should be treated by operation. While, in the past few years there has been a gradual drawing nearer of the surgical and medical opinions, the extreme views are, however, still held by some. After a study of the indications for the surgical treatment of ulcer, as given by Sippy[7] in a recent article, one concludes that in that author's opinion very few cases of peptic ulcer should be treated surgically. On the other hand, Deaver[8], in an article of recent date maintains that nearly all cases eventually require surgical treatment. Many surgeons now advise a thorough course of treatment such as that known as the Sippy treatment, before any surgical procedure is attempted.

Until recently there was not much difference of opinion among surgeons as to the proper type of operation to employ in the usual cases of peptic ulcer. It was the more or less rare types of ulcer, or the complications of ulcer, that furnished the surgeons a topic for controversy. Latterly, however, many surgeons are questioning or deprecating the more or less established rules for treating ulcers, especially those occurring on the duodenal side of the pylorus. The treatment of gastric ulcer has not been the cause of so much argument, because of the more or less universally accepted theory, or fact, that gastric ulcers often undergo carcinomatous changes and consequently any treatment that fails to eliminate the ulcer falls decidedly short of being ideal.

Since Finney, 20 years ago, described his technic for treating ulcers near the pylorus, he and his disciples were, for a long time, practically the only objectors, in this country, to the more or less generally accepted belief that a gastro-enterostomy was the operation of choice in ulcers near the pylorus. However, in recent years the supporters of this procedure have found more opponents, mainly due to the realization that a gastro-enterostomy does not always accomplish the desired result.

Duodenal ulcer is now treated surgically by about five different types of operation: (a) excision of the ulcer; (b) gastro-jejunostomy; (c) pyloroplasty; (d) gastro-jejunostomy with excision or cautery of the ulcer; and (e) pyloroplasty with excision or cautery of the ulcer.

Simple excision of a duodenal ulcer is indicated only in those ulcers occurring at a distance of one-half inch or more from the pylorus, and situated on the anterior duodenal wall. When indicated, the operation described by Judd[9], that of excising the ulcer by means of an eliptical incision made transverse to the long axis of the bowel, is a practical one.

Gastro-jejunostomy alone, was, for a long time, considered the most rational operation for duodenal ulcer. However, there are now many surgeons who have changed their opinions and advocated other operations in its stead. W. J. Mayo[10], who, with his associates at the Mayo Clinic, has been a strong advocate of a simple gastro-jejunostomy, says that as satisfactory results can be obtained without the excision of the ulcer in 90 per cent of the cases, it is of questionable advisability to subject the one hundred to the added danger of an excision merely to save the ten from a second operation.

The advantages of a gastro-enterostomy are that the usually hyperacid condition of the stomach is overcome by the passage of the alkaline intestinal fluid into the

stomach, thus controlling the spasmodic condition brought on by the excessive acidity, and the promotion of a more rapid emptying of the gastric contents. This operation is most successful in those cases showing gastric retention. The arguments advanced against gastro-enterostomy are that it leaves the symptom-producing ulcer, and subjects the mucosa of the jejunum, which is normally bathed with an alkaline secretion, to the trauma of an hyperacid secretion, which in from two to three per cent of the cases produces a gastro-jejunal ulcer. This sequela occurred in 1.3 per cent of 3,700 cases reported by Eusterman[11].

Pyloroplasty has recently been advocated by an increasing number of surgeons. The fact that there is less disturbance of the normal anatomical arrangement than after gastro-jejunostomy, and consequently the danger of gastro-jejunal ulcer is eliminated, is the chief reason for its growing popularity. Finney[12] has, for years advocated this operation, with excision of the ulcer in certain cases of ulcer near the pylorus. Horsley[13] has described a type of pyloroplasty which he thinks is applicable to many cases of peptic ulcer, even those with obstruction, and constricting bands on the posterior wall. He[14] has recently reported 43 cases so treated. He states that when adhesions to other viscera than the gall-bladder are present the operation is not indicated.

A gastro-enterostomy or a pyloroplasty is often combined with an excision or cautery of the ulcer. When the ulcer is easily accessible the excision method can be used. Those ulcers which cannot be easily excised can oftentimes be destroyed by the actual cautery. The destruction or removal of the ulcer eliminates one objection to a gastro-enterostomy, and adds one advantage to a pyloroplasty.

In operations for gastric ulcers, four procedures may be followed: gastro-jejunostomy, gastro-jejunostomy with excision or cautery of the ulcer, pylorectomy and sleeve resection.

Gastro-jejunostomy, alone, is indicated only in cases where the ulcer cannot be reached to excise or cauterize it, and in cases in which the patient's condition does not justify the added time and risk to do more.

Ulcers on the anterior wall, on the greater curvature, or on the lesser curvature, or even on the posterior wall, situated at a distance from the pylorus can be treated by excision or cautery of the ulcer, followed by a gastro-jejunostomy.

In large ulcers, which are not adherent to surrounding viscera, a sleeve resection may be done. This operation is usually feasible in ulcers of the pars media only.

When the patient's condition permits, ulcers near the pylorus are best treated by pylorectomy. When the condition of the patient is critical the operation may be done in two stages, using the Billroth No. 2 method. This operation consists of an excision of the pyloric portion of the stomach, inverting the cut end of the duodenum, and the stump of the stomach, and then doing a gastro-enterostomy. It may be done in one or two stages.

The Polya type of pylorectomy has some advantages over the Billroth operation, especially when done according to Balfour's modification. Horsley[15] states that the Polya type of pylorectomy has chiefly three advantages in that it "Enables more of the stomach to be removed, because the wound by the old technic was infolded and carefully sutured, which takes at least an inch more of the stomach than when sutured directly to the jejunum; the nutrition of the stump of the stomach is augmented by applying to it a loop of jejunum whose blood supply has been unimpaired; and the time of the operation is shortened by removing the necessity for a gastro-enterostomy." Woolsey[16] has stated that in his hands the Polya operation has been the most satisfactory of all operations for peptic ulcer.

Simple excision of a gastric ulcer, is now rarely performed because of the fact that a large percentage of patients so treated, later required a gastro-enterostomy.

Acute perforation of an ulcer, is one condition in which all clinicians agree that an immediate operation is indicated, the percentage of recoveries being in proportion to the length of time elapsing between

the perforation and the operative closure of the opening.

It has long been a disputed question among surgeons whether or not simple closure of a perforation is all that is required in the surgical management of acute perforation. Those favoring the closure, without gastro-enterostomy, argue that many cases of acute perforation were previously free from any symptoms of chronic ulcer, and consequently, the perforation is the only feature requiring treatment; and that to do a posterior gastro-jejunostomy increases the danger of peritonitis, and also requires an unnecessary addition of time for completion of the operation. The advocates of closure followed by gastro-enterostomy answer these objections by saying that the peritonitis following the perforation is general, and consequently cannot be increased by making a new opening in the stomach; that the performance of a gastro-enterostomy requires a very few minutes; that it by altering the reaction of the gastric contents permits more permanent healing of the ulcer; and that it avoids the possibility of a secondary operation.

Surgeons are now beginning to realize that many of the unsatisfactory results met with in the past have been due to their failure to appreciate the fact that the patient was not cured as soon as the operation was completed; and that many cases of return of symptoms were due to a too rapid return of the patient to a regular diet.

To insure a higher percentage of symptom-free cases following the surgical treatment of ulcer, it is necessary that, for months after the operation, the patient be kept under observation, preferably by a competent internist, who can so regulate his habits and diet as to avoid the danger of post-operative ulcerations, by controlling the amount of food taken at one time, by avoiding foods which stimulate the flow of hydrochloric acid, and by the administration of alkalis to diminish the acidity of the peptic area should an hyperacidity exist.

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DISCUSSION

Dr. Irvin Abell, Louisville, Ky.—Accurate and definite knowledge regarding the etiology of peptic ulcer is not at hand. If the etiological factors that enter into the formation of peptic ulcer were all embraced or comprised in the one, small, circumscribed area in which ulcer begins, the excision of that would give us uniformly good results. We know from experience that this will not occur. Upon the fact that ulcers recur, both multiply and singly, is based the indication that there is something more than the pathology in the mucosa. If we accept the hematogenous idea, as presented by the essayist with others, then we can accept the recurrence of ulcer after it has been cured, as further blood borne infection, but the type of ulcer that occurs in the jejunum after gastro-enterostomy does not lend itself to such an explanation.

Again, one will observe cases from time to time that would lend credence to the contention made by some that peptic ulcer is but the expression of an underlying constitutional condition. Six years ago I did a sleeve resection for a chronic ulcer of the pars media of the lesser curvature. We had complete relief, but only temporarily. In 15 months this man returned presenting symptoms of ulcer. At the second operation multiple ulcers were found both proximal and distal to the former line of resection. Surely such an observation as this must lead one to think that there is something more than a local condition in such instances which gives rise to such a widespread recurrence of lesions. The unrest that exists in the profession today regarding the method of treatment of ulcers I think indicates

quite clearly that neither medicine nor surgery will cure all of them.

In our practice the operability is determined by two factors: the clinical history and the x-ray findings. The duration, chronicity, the hemorrhage, marked change in the stomach or duodenal wall as evidenced by x-ray examination, the interference with stomach drainage, the presence of disturbance of gastric function to such a degree that the strength and health of the individual are impaired, are to us clear indications that surgery in that particular group is the treatment of choice. In the beginning, the acute ulcers, those in which the history is of short duration, those in which there is no marked bleeding, those in which the disturbance of gastric function is still commensurate with activity of the individual, not interfering with his ability to work or his strength, these we feel can be treated about as satisfactorily by medicine as by surgery and should have the benefit of that treatment. I grant you that such symptoms will not always conform to the pathology that is present since it is practically impossible to correlate correctly the degree of symptoms with the extent of disease, without the aid of ocular inspection. Some cases of marked infiltration give a small amount of symptoms while others with a small ulcer defect will cause marked symptoms. I have seen perforation of a duodenal ulcer in a patient who was just out of bed where he had been for six weeks under treatment for a mild but definite ulcer syndrome. He was apparently free of symptoms and started to work, but a perforation occurred on the way, to his office. Such a clinical distinction, I grant, will not conform to the degree of pathology that is actually present.

When we come to the form of operation, as indicated by the essayist, we shall have much difference of opinion for the reason that the varying pathology present when the abdomen is opened will not always be amenable to any one type of operation. It must be adapted to the condition found upon opening the abdomen. If feasible the ulcer should be removed or destroyed. In a perforation of a duodenal ulcer into the head of the pancreas or a calloused ulcer involving the head of the pancreas, this would institute such active trauma that its use would be prohibitive and we have to be content with less. In the ulcers of the anterior duodenal wall we have employed excision without attempting posterior gastro-enterostomy. That particular series has given us satisfactory results to such a degree that we shall continue to employ such a procedure in ulcers so situated. In the duodenal ulcers that are not accessible we shall have to depend upon gastro-enterostomy; but here you will find that notwithstanding the assistance of our medical friends, and they give us great assistance, they will not all get well. I have seen one case of fatal hemorrhage in such a case. In the ulcers situated at or near the pylorus some type of pyloroplasty, particularly where the localization and accompanying pathology permit of mobilization and suture, I think is the ideal operation. It permits of removing the ulcer and gives drainage. It does not destroy the anatomic relations to any degree and the few we have done have given us satisfaction.

The type of ulcer that has given us trouble has been the chronic inflammatory ulcer along the lesser curvature near the pylorus and we have concluded that in this the only operation that will be satisfactory is the one described by the essayist as the Billroth No. 2 or the Polya. This goes back years ago but in these ulcers on the gastric side of the pylorus there is hardly any other operation that will so satisfactorily take care of them.

The sleeve resection, as indicated by the essayist, will take care of those large calloused ulcers in the lesser curvature, whereas resection with a cautery or knife, accompanied by posterior gastro-enterostomy gives satisfactory results in a majority of cases in which the ulcer is situated elsewhere.

We have confined our treatment of perforation chiefly to mere closure and most of the patients have remained symptom-free, the closure of the perforation alone being enough to relieve the symptoms.

Following the publication of Deaver's paper some years ago we began doing a posterior gastro-enterostomy in the cases in which the location of the ulcer was such that it formed a marked obstruction to the drainage. All of the patients so treated recovered and, with the exception of one, they are symptom-free.

Finally, I wish to make the statement that as my experience with peptic ulcer has become greater, my conviction has become more firm that it is not a medical or surgical proposition but that it belongs to both fields, and that only when the physician and surgeon collaborate in the preparation and treatment of the patient, and in the after-care and management of the patient, when you realize that the surgery, as expressed by the Chairman in his splendid address, is a means of permitting proper supervision of diet and proper after-treatment, then only will we obtain the most satisfactory results.

Dr. Lucius E. Burch, Nashville, Tenn.—This subject, at the present time, is the battle ground between the internist and the surgeon. I am of the opinion, as expressed by Dr. Abell, that these cases should be managed by both the internist and the surgeon, and I might also add, the roentgenologist. There has been much confusion in the past, due to the fact that many internists have treated patients with so-called ulcers where ulcers really did not exist, and the surgeon, not so many years back, has operated upon

cases where ulcer was not visible and of course with poor results.

In my discussion I shall limit myself to the treatment of this condition. I think both surgeon and internist will agree that the medical man should be given an opportunity to treat these cases first, and then if under proper medical supervision for a certain period of time the patient does not improve, the case should be referred to the surgeon.

I also take the view that in case of perforation a gastro-enterostomy should not be performed. The most important thing of all to be remembered is to save life, and the majority of cases that perforate will get well and remain well after the ulcer is closed.

It is impossible to lay down a hard and fast rule in regard to the selection of the operation and I do not believe we shall settle this problem at this meeting. Dr. Horsley, of Richmond, a member of this Section, has brought out an excellent operation for pyloroplasty, but it is applicable in only a limited number of cases. The results, however, in this limited number have been excellent. The ideal operation, of course, is the removal of the ulcer-bearing area. It is, however, an operation of a higher mortality than gastro-enterostomy or pyloroplasty, and for this reason it cannot always be used. At the present time I am of the opinion that the majority of cases are better handled by the removal or destruction of the ulcer, supplemented by a gastro-enterostomy. I feel that the last suggestion which the essayist made in his paper is a most important one, that regardless of the operation performed, the patient should be placed under careful medical supervision for quite a period of time following the operation.

Dr. Charles G. Lucas, Louisville, Ky.—Two things, to my mind, must be considered in peptic ulcer: first, the causative factor; and second, the question of chronicity. It is possible that peptic ulcer is merely the local manifestation of a systemic condition, as Dr. Abell suggested, but is it possible that we can examine these cases and determine the chronicity of the ulcer? I think Smithies, of Chicago, has proved by his research that many ulcers existing only a few weeks were hard and firm, while others dating back over many years were soft. Another thing, we get certain results following operation, primarily because of the operation, secondarily because of the rest. It has been extremely difficult in my work to get these patients to take sufficient rest and I venture to say that if statistics were prepared upon the number of weeks spent in bed by these patients at any previous time we might understand this better.

What influence do the general habits of life have on these ulcers? I have now under treatment an Englishman who has the history and clinical findings of ulcer dating back 15 years. He is now 37 years of age. His previous history gives several attacks of tonsillitis. At the time of the war he left Louisville and went into the English army. He served with it for four years, going "over the top" and living in the trenches during much of the time, but had no trouble. After his discharge he had some trouble again and has a fine collection of x-ray pictures from gastro-enterologists both in England and America. When I went over him thoroughly and suggested to him that the only sensible thing to do was to submit to an operation he refused very promptly, and that is often the case.

Now, what effects do we get from treatment? In the hands of a capable surgeon we get the best, of course; but the gastro-enterologist sees many cases that have had poor surgery and it is the poor surgery that gives us the bad impression.

I would like to correct something Dr. Abell said about his case of sleeve resection. I had seen the patient eleven years ago and he was operated upon six years ago. The results from operation were perfect but his habits could not be controlled. Every Saturday night he played poker and indulged in his favorite tipple, Tom and Jerry. Since his second operation, which showed the beautiful result of the first, he has been doing better.

I heard Dr. Trout's address and was much struck by the remark that after a patient was put in shape by the surgeon, his medical man should take care of him. I wish to endorse that heartily and I also wish to endorse the remarks of the essayist and the two who discussed it, about constant treatment following operation.

Dr. J. B. McElroy, Memphis, Tenn.—Uncomplicated ulcers I think should be subjected to medical treatment, and many of them will get well. Those which are complicated should be referred to the surgeon and the only quarrel I have with the surgeon now is that when these cases are referred to him it is thought this is all that is necessary to effect their cure. I find that after they have been operated upon there is often a great deal of complaint and a great deal that is lacking in the care of these conditions. The key-note of treatment as was so well expressed by Dr. Abell, is that uncomplicated ulcers should be submitted to medical treatment and those which are complicated should be subjected to surgery; and then these patients should be carefully supervised medically following operation.

Dr. Richard A. Barr, Nashville, Tenn.—I hate to introduce a discordant note into this discussion when it seems that the internists and surgeons are ready to make peace. With regard to the discussion as to when an ulcer becomes surgical it is only in the clinics that there is any

difficulty about a surgeon's deciding whether a case is surgical or not when it comes to him. If he is associated with an internist then he may see cases sufficiently early for there to be some chance for discussion. I have a surgical practice without any associate and when any case comes to me it is usually apparent that it is one for surgery. Mayo has said that an ulcer becomes surgical when it has had nine or ten complete medical cures. Judging from the discussion here we now have added to that a surgical cure and then the tenth or eleventh medical cure. At the Mayo Clinic they are building a kitchen to teach these patients how to cook and how to live after being operated upon. That is quoted from a statement by W. J. Mayo in the *Journal of the American Medical Association*, July 1, 1922. That is rather intricate and expensive and many people cannot live up to it. The proper procedure is for the surgeon to do enough surgery to cure his patient. It is true that these patients have often bled until they are so anemic that transfusion and medicine will not get them in shape for the complete operation you wish to do, and in such cases you may have to do two or three successive operations. Such multiple operations I believe are justifiable. However, I do not believe you can justifiably do an operation under ordinary conditions that carries only 70 or 80 per cent of cures, and then have the others come back for further surgery. It would be of great interest to know something about the etiology of ulcer. We have discussed etiology extensively this morning but very little is known about it. We always discuss it in great detail but we really know nothing about it except that ulcer of the stomach is usually associated with hyperacidity, and our effort in treatment is to try to lower that. We do know that there is some association between acidity and ulcer, and between these and the pyloric end of the stomach, and we know that if a pylorectomy is done we are not troubled further with peptic ulcer.

Our surgical effort should be to remove the ulcer and to try to prevent the formation of others, in the suture line or anywhere else. To cure an ulcer by surgery you have to resect it, that is if you are going to be sure to cure it. If you are going to prevent the development of other ulcers you have to do a pylorectomy, no matter where the ulcer actually present may be located. No matter what your opinion may be with regard to the "gastrin" theory you will admit that if you remove the pyloric end of the stomach you will not likely have further trouble from ulcer. Moynihan has done 118 partial gastrectomies for gastric ulcer with two deaths, and if he can reach that mortality others can. Nobody will dispute the benefit of partial gastrectomy. If the ulcer is located on the gastric side of the resected area you have to remove that in addition.

In ulcer of the duodenum you can resect or burn it out and so get rid of the ulcer itself. If you do a gastro-jejunostomy in addition you have a possibility of the formation of a jejunal ulcer either at the line of suture or lower down with of course a chance for recurrence of duodenal ulcer. If you do the Finney operation, gastro-duodenostomy, you do not do anything for the patient that you can visualize unless you remove the ulcer. You do not do any good by enlarging the gastro-duodenal opening for the stomach empties too rapidly anyhow in the majority of instances. Those duodenal ulcers that sit up on the anterior wall and are easy to get at for resection do not come to me. They go to the clinics or at least do not come to me. It is recommended to resect duodenal ulcers where "feasible" but two-thirds of the ones I get hold of are not amenable to resection by Finney's method or any other, and in addition, this immovable ulcer is the very type that does the least good with simple gastro-jejunostomy. The value of the ordinary advice for the surgical treatment of ulcer fades into insignificance when you get the ulcers that come to me. I believe a partial gastrectomy is just as clearly indicated in duodenal ulcer as in gastric ulcer. You cannot always include the ulcer in the excised area but you get rid of that part of the stomach that breeds ulcer and you put the ulcer itself at complete rest so it is not troubled any further by muscular movement or acid secretion. You can do the Billroth No. 2 or the Moynihan procedure, as you choose, but for duodenal as well as gastric ulcer, I believe the only real treatment is partial gastrectomy.

Dr. Robert L. Sanders, Memphis, Tenn.—The proof of the pudding is in the eating and the proof of the method of operation is the way the patient gets along afterward. Nashville men are going strong on excision of the ulcer. Dr. Barr says certain types of ulcer come to him but in Memphis we see the ones in which we cannot afford to do pylorectomies if they are on the duodenal side. Often much edema is present and leakage may follow. One is liable also to encroach upon the common duct and other important structures. It seems entirely useless to do so much and to add an additional mortality percentage, when a simple gastro-enterostomy will suffice and, in fact, be much better.

I wish to register myself as opposed to resections when the ulcer is duodenal. A gastro-enterostomy, with or without enfolding the ulcer, will usually be effectual. Pyloroplasty may be used in selected cases. Dr. Horsley has given us something that is apparently an improvement on the old Heineke-Mikulicz operation. The outstanding feature of his modification is the extension of the incision further on the gastric side. His case reports are few but good. I am looking forward with much interest to the end results of his cases.

There is one type of case which has not been referred to at all this morning and that is the large ulcer on the lesser curvature near the cardiac end, referred to recently by Moynihan in his little book. We have seen a few cases and the handling of them has given us much concern.

In such ulcers situated there the infiltration and edema are so pronounced that sleeve resection or any type of operation is almost prohibitive from the standpoint of mortality. Moynihan has advocated leaving the ulcer alone, putting in a jejunostomy tube and feeding the patient for a certain time through this tube to permit the ulcer to undergo spontaneous healing. We have had such a case recently, where there was delay in emptying in the lower pouch, so we added a posterior gastro-jejunostomy to drain the lower pouch well, and then fed the patient through the tube. She has gained 15 pounds in weight, has taken nothing by mouth in 90 days, is perfectly comfortable and we feel she is going on to complete recovery. The internist has been disappointed in the treatment of this type of case and the surgeon has been disappointed also because the ulcer is inaccessible. Moynihan in his little book has stated that he has done three sleeve resections, that they all produced contracture and he condemns the procedure. Our experience has not been so bad but it has produced a contraction approaching an hour-glass in the third case of our series. It may be similar to the one mentioned by Dr. Abell and the patient may again be approaching the formation of ulcer at that point. At any rate, our sleeve resections have not been entirely satisfactory.

TENDON TRANSPLANTATION*

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The purpose of this paper is not to outline in detail the technic of any one operation or to report any entirely new procedure, but to set forth a few salient points that have proved of actual worth to the writer in this particular field of surgery.

Since the introduction of subcutaneous tenotomy in 1831 there have been many operations devised upon tendons for the prevention and correction of deformities. Indeed, surgery of tendons has favorably kept pace with the rapid progress in other lines of surgery.

While admitting that some noteworthy advances were made in this work in the last half of the past century, we know that during the past twenty years more advantageous procedures were devised and more brilliant results obtained than in all the preceding years.

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Tendon transplantation finds its widest application and greatest usefulness in the residual paralyses of poliomyelitis, in the paralyses of traumatic origin, and to a less extent in spastic paralyses.

It would seem, from the immense volume of literature written on the various phases of the subject in recent years, that there would be little remaining to be said. Always a fascinating subject, full of promise and possibilities, tendon transplantation lends itself admirably to the experimental, creative mind of the surgeon with a mechanical tendency, but it is gradually reaching its level of efficiency and the future will witness more conservatism and the limitations will become more accurately defined.

Procedures of the most ingenious sort, which promised much at first, have been tried and for some reason or other have been found useless and been promptly discarded. Some, having enjoyed a short period of popularity and apparent usefulness, are gradually being abandoned and soon will be only of historical interest. Others, fortunately, have proved to be so practical in application and pleasing in results that they deserve to be and will be constantly used in correction of various paralytic deformities. While the field is open for the development of new ideas—and investigation should be encouraged—the writer feels that we should take stock of what we have, accept operations of proven worth and endeavor to improve the results of these by more judicious selection of cases, by more nearly perfect technic at operation, and by better after-treatment.

Tendon transplantation in the strict sense of the term means transference of the insertion of a tendon from one bony point to another. Tendon grafting, while very closely related to transplantation, means implantation of one tendon into another. Both procedures are intended to improve existing muscular function by restoring muscle balance.

To achieve the greatest possible success in this field of surgery one must be able intelligently to select cases favorable for transplantation. One must understand the basic principles involved and be able skilfully to execute them at the time of

operation. One must be in position to perform or closely supervise the after-treatment for a reasonable length of time. Many attempts to improve muscle balance have failed because one or more of the three above requisites did not obtain. A large number of failures could have been prevented had the surgeon realized beforehand that the muscle whose tendon was to be transplanted could not possibly perform the function of the paralyzed muscle because of its lack of strength. Other failures could have been avoided had the surgeon perfected himself in the intricacies of the procedure. Still other failures are credited, not as a result of an unfavorable subject, or lack of skill in execution, but to imperfect after-treatment. When one or more of these conditions exist, what might have been under different circumstances a brilliant success, pleasing to both the surgeon and patient, actually terminates in utter failure with its attendant disappointments.

It is generally conceded by orthopedic surgeons that the transplantations most likely to succeed are those at the knee, at the ankle and foot, and in the forearm and hand. Another accepted fact is that it is better to utilize, when possible, a muscle analogous in function to the muscle to be replaced; better still, a muscle with the same nerve supply. However, this is not absolutely necessary. A flexor to replace a flexor, an extensor for an extensor is desirable, but a flexor may be made to perform the function of an extensor and vice versa.

From the study of results in about 160 cases of tendon transplantations, the writer is convinced that the procedures which yield good results most consistently are the following:

Transplantation of the peroneus longus into the insertion of the anterior tibial in talipes valgus; transplantation of the tibialis anticus into the outer aspect of the dorsum of the foot in talipes varus; transplantation of the extensor communis digitorum and extensor longus hallucis into the dorsum of the foot in cases of moderate cavus with hyperextension of the toes; the peroneus longus and the flexor longus hallucis into the os calcis to reinforce the calf group, but not to replace these muscles when completely paralyzed; and transplantation of the biceps femoris and the sartorius or semitendinosus into the patella for weakness or paralysis of the quadriceps. In the forearm and hand there are many possibilities, but the one outstanding procedure is transplantation of the flexor carpi radialis, flexor carpi ulnaris, and pronator radii teres for the extensors of the wrist, thumb and fingers in radial paralysis. There are other single transplantations and combinations of transplantations which at times prove worth while and, indeed, a brilliant result may be obtained. The ones enumerated are, under favorable conditions, consistently dependable.

Before Operation.—A rather large number of ultimate failures can be attributed to errors of judgment before operation. It goes without saying that every surgeon who offers to do tendon surgery should have a thorough knowledge (actively working) of the anatomy, histology, and physiology of tendons and surrounding structures. The blood and nerve supply, the origin, insertion and direction of the muscles under consideration should be thoroughly known. The relative strength of the various muscle groups should be known. One should know fairly accurately the strength of a muscle to be transplanted and the strength in the normal state of the muscle to be replaced before the operation is begun, for it is manifestly a mistake to substitute a muscle of 5 pounds strength for one whose function is to lift 50 pounds. Again, where a muscle in normal health could easily perform the function of some other muscle, it might under other conditions as, after poliomyelitis, be utterly unable to perform the task. Generally speaking, a muscle of less than one-third the strength of the muscle to be replaced should not be transplanted, for with the loss of power which naturally follows the procedure itself plus the extra burden of performing a new function, it may result in complete loss of power. Unless the tendon to be transplanted has practically normal strength a special course of exercises and massage should be given as a preoperative measure to bring the muscle

to as nearly normal strength as possible. In cases where tendons of opposite function are to be used the patients should be taught to use those muscles well before operation, for then the task of re-education will not be so great.

To approximately determine the strength of various muscle groups and individual muscles a spring balance test was made on a group of normal children, ages ranging from 5 to 18 years. Each age was represented by 6 boys and 6 girls. The muscles of all four extremities were similarly examined and readings recorded. The maximum and minimum strength in pounds was noted and the average taken for each group of muscles at a given age. With this table one is enabled to ascertain at a glance the approximate strength of any group of muscles and compare them with the findings in the patient to be operated upon. Of course, this is not absolutely accurate, but it does serve as a valuable aid. The table shows in the following opposite groups that the normal average strength is: dorsi-flexors of foot to plantar flexors as one to three; adductors of foot to abductors as one to one; knee flexors to knee extensors as one to two; wrist flexors to wrist extensors as five to three; finger flexors to finger extensors as four to one, etc.

With this knowledge it is easy to understand why transplantation of the biceps femoris alone for a paralyzed quadriceps is not likely functionally to succeed, for normally the combined strength of the knee flexors is only one-half the strength of the quadriceps and, granting that the biceps represents one-third the power of the flexor group, we have a muscle trying to perform the function of a muscle six times its strength. In theory it would not, and in practice it does not, succeed. This same line of reasoning can be carried further and serves to explain the futility of expecting the flexor longus hallucis and one of the peroneals to perform the function of the paralyzed calf group. However, when used to reinforce only weakened muscles of this group, they may be expected to work to much advantage.

All obstructing deformities should be completely removed before the tendon is transplanted.

In paralyses following poliomyelitis transplantations should not, ordinarily, be done until at least two years have elapsed since the acute illness and not then unless the patient has reached the age of six years.

In traumatic paralyses it is necessary to wait only long enough to be assured that regeneration of the nerves will not likely take place.

In spastic paralyses only in the cases that show sufficient mentality to cooperate effectively should any transplantation be performed.

At Time of Operation.—Every surgeon has his own choice method of preparing the operative field, but as a rule it is considered sound practice to shave, scrub, sterilize and apply sterile dressings the day before. Resterilization just before the operation is begun. An Esmarch bandage with a tourniquet greatly facilitates matters and when properly applied may be considered safe if the operation does not last for much more than an hour. The ends of the toes if the operative field extend to the foot and the ends of the fingers if at the hand, should be completely and continuously barred from the operation until the final dressings are applied. Until the last skin suture is tied, the most refined technic with regard to asepsis must be followed by every one engaged in the operation. Sutures, needles and tissues should be touched only with the business end of the instruments. Suture material and the tendon should be carefully protected from the skin by use of towels or gauze. The steps of the operation should be so executed that the tendon shall receive a minimum of trauma and be exposed to the air the shortest time possible. This may be accomplished first by preparing the site for the new insertion, followed next by exposing and opening the upper end of the old sheath where the new tendon is to be brought into line with the original tendon, then passing of the threaded tendon carrier through the sheath down to the site prepared for insertion. This remains until the new tendon is detached, dissected up to the required point, the anchoring sutures placed through the tendon, and then brought and attached to the carrier which

is then used to pull the tendon through the sheath. The incision exposing the transplanted muscle should be closed, but first suturing the split sheath, paying close attention to ligation of vessels. The insertion is then completed, all incisions closed, and dressings applied.

Wherever possible, and it is usually possible with tendons at the ankle and wrist, the transplanted tendon should pass through the entire length of the old tendon sheath. The process of transferring the sheath with its tendon is more complicated, produces more trauma, and does not furnish any better gliding medium than the old sheath. In tendons where the sheath method is not feasible, as in transplantation of the hamstrings for the quadriceps, a spacious subcutaneous channel should be made. All rough surfaces of bone, periosteum, or fascia which come into intimate contact with the tendon or its muscle should be securely covered with a suitable fat pad. This minimizes the danger of troublesome adhesions which develop very rapidly and which tend to lessen the force of the muscle pull, if indeed they do not destroy all chances for success.

The integrity of the insertion of a tendon must be beyond question, for if the insertion is not stable the operation is a failure. Since it is impossible to reproduce exactly the original insertion, the next best method is implantation into bone and not into the coverings of the bone. By this is meant, a hole is chiseled out of the bone to the depth of one centimeter where there is plenty of substance and into the medullary canal in the small long bones of the hand and foot, the tendon end drawn down to the bottom and firmly held by passing the anchoring sutures from within out and back where they are tied. The small flap of bone and its periosteum are then sutured into place, followed by closure of the soft parts. The tension of the transplanted tendon is of importance. At the foot, for example, with moderate, not extreme over-correction the tendon should be left under slight strain so that when over-correction is carried a few degrees further the tendon is somewhat relaxed. This position should be held until the plaster cast is strong enough not to yield. The course of the tendon from its muscle to its insertion must run as nearly straight as possible. It is usually a wiser procedure to sacrifice a few of the lower muscle fibers by detaching them from their origin than to angulate the tendon acutely in its course.

In a large proportion of cases it is rarely necessary to use heavier anchoring sutures than No. 2 chromic cat gut (thirty day). Where this is considered not strong enough, medium kangaroo tendon may be employed.

After the Operation.—The importance of correct after-care of these cases cannot be too thoroughly emphasized. Within the first twenty-four hours immediately following the operation, the top of the cast should be removed, the bandages and cotton slit from top to bottom, making sure that all constricting threads are severed, and then the top replaced and bandaged. This not only adds to the comfort of the patient, but materially minimizes the likelihood of adhesions.

At the foot and the knee active exercises should be started the fourteenth day, while at the hand ten days is long enough to wait. These exercises should be very mild and continued for only a few minutes each day, but gradually increasing. Baking should be employed for ten minutes in connection with the exercises. The position of the member should not be disturbed for from three to four weeks, at which time it may be removed entirely from the cast and the treatment continued, but always protecting the tendon insertion against gravity. For the following two weeks the cast should be replaced after each treatment. Some supporting apparatus should ordinarily be worn for from eight to twelve months after operations at the knee and ankle. At the wrist and hand it is hardly ever necessary to wear supporting splints for longer than four months.

CONCLUSIONS

Tendon transplantation was a brilliant contribution to the surgery of paralytic deformities.

lier years has given way to conservatism.

Much of the experimentation of the ear-

Procedures of known worth should, as a rule, be employed and perfected by more careful selection of cases, by improvement of the operative technic, and by more thoroughly supervised after-treatment.

The better these points are remembered and practiced in each case, the less chance for needlessly inflicting our patients and casting opprobrium upon ourselves and the profession.

DISCUSSION

Dr. G. E. Bennett, Baltimore, Md.—Dr. Roberts said that he thinks one should wait about two years after the acute stage of poliomyelitis before attempting tendon transplantation. Of course, that is only an opinion. My personal opinion is that two years is too short a time. If one is going to do any really constructive work in poliomyelitis, postponing it a little longer means nothing, and not infrequently one finds that tendon and muscle power does come back after that time. I remember that I had a most disastrous experience with a little child that came to me some fourteen years ago with very marked valgus deformity. It was not the tendon I transplanted that produced the tendon deformity, but the tibialis posterior came back to power and produced the deformity with the peroneal I had transplanted.

I tell my students not to do any operative procedures to balance up muscle power until five years have elapsed. Of course, one can do operative procedures to correct deformity, such as lengthening tendons, but I am rather confirmed in my opinion that one should wait a good long time before transplanting tendons.

There is another thing which came up, and that is that the power of the tendon transplanted is never equal to that of the original. I believe that when you put with your tendon transplantation some other opposite procedure the tendon does not have quite so much to do. Then you do not have to have a muscle that will perform its full function, but if it does even 30 or 50 per cent of what it should do, the other operation will assist you. If the transplanted tendon will do 50 per cent, we can add the other 50 per cent by some other structural operation.

It has always seemed to me rather amusing that a man will be so very careful in taking a peroneal tendon out of its sheath and opening up the sheath of the tibialis anticus and passing it down through the sheath. Why in the world, instead of putting it in, does he not take out the dead tibialis anticus and send it down through the sheath, and not have both tendons in the sheath, which is large enough only for one? I would like very much to hear what the others think about it.

Dr. A. G. Nichol, Nashville, Tenn.—Reasonable knowledge of muscle mechanics is necessary, of course, in all tendon work. It is very unreasonable to assume that one can transplant a weak muscle to do the work of a strong muscle. In practically all instances the muscle transplanted is not so strong as the one for which it is being substituted, and, therefore, one will get a certain amount of overstrain and overwork, and in small tendons one will not secure the result expected. The best results are obtained about the ankle.

In the North and East they see quite a lot of poliomyelitis, but not so much in this section. We have not had the wider experience that those men have had. The basic principle is having a reasonable knowledge of what we are trying to do, and in orthopedics it applies more than in anything else, never to do anything without sufficient reason for it. It will apply as clearly in orthopedics as in any other branch of medicine.

Dr. Lawson Thornton, Atlanta, Ga.—In cases of paralytic feet, we think of the remaining muscle power as much in terms of a deformity as of the ability to maintain function and normal architecture.

First, we plan to produce a stable foot with normal architecture and then place the tendons where they will be of greatest service. Dr. Michael Hoke's foot stabilization operation gives a stable foot with normal architecture.

Some prefer to consider tendon transplantation of paramount importance in infantile paralytic feet. But, if the foot stabilizing operation be also done, the success of tendon transplantation is assured.

Dr. R. W. Billington, Nashville, Tenn.—The supplementing of tendon transplantation with other procedures, in order to obtain stability, is something that is necessary if one wishes to get permanent results in transplantation about the ankle, because one remembers that the foot is none too strong in the normal individual. When there is a condition that justifies a tendon transplantation, there is a weakening of the musculature, and we shall further weaken it by the tendon transplantation. So we should stop and consider what is the best means of obtaining stability, whether we have to sacrifice movement to get stability, and what movements we can best afford to sacrifice. That means, of course, that lateral movement of the foot is the least essential, and that is the one we shall have to sacrifice to get stability and use what power we have to get flexion and extension.

The upper extremity is quite different, because we have no problem of stability to consider so far as weight bearing is concerned. Before my experience in the war, and seeing and doing quite a bit of this work on the upper extremity, I was very skeptical and was surprised to see the good results that were being obtained when we went across. I saw some of the early cases they did at Liverpool, particularly by Sir Robert Jones and Major McMurray. In paralysis of the radial nerve we can, by two or three operations that were devised then, get perfectly remarkable results. In median and ulnar paralysis the results are somewhat less satisfactory.

If we make up our minds, in dealing with the lower extremities, that we must obtain stability first of all, and that we can get that stability by doing an astragalectomy or subastragaloid arthrodesis, we can get very satisfactorily functioning limbs.

Dr. Fred G. Hodgson, Atlanta, Ga.—There is one point which I think has not been sufficiently emphasized in doing reconstruction work and industrial work upon the tendons of the hands and fingers. I have seen some very disappointing work in reconstruction of the tendons of the hands, especially in cases with stiff joints that were not mobilized before the tendon operation was performed. We find the joints of the finger very stiff and difficult to move, especially where a long splint has been used. It is very important to use massage and thoroughly mobilize stiff joints before expecting a transplanted tendon to do its work. I think we could prevent many adhesions and much scar tissue which make these operations necessary by proper incisions, especially in infected hands or large palmar abscesses. The very excellent work of Kanavel on this subject, the infections of the hand, is well worth study. The splints should not be kept on long enough to make stiff joints. It has been my rule to use few splints or none at all, and to start early motion and massage, even before the wounds are healed.

Dr. E. G. Brackett, Boston, Mass.—The subject of tendon transplantation has always been interesting and one strewn with more failures and disappointments than almost any other procedure in surgery, due, I think, many times to lack of caution in the things to which Dr. Roberts has called our attention, and also to the lack of proper care in the selection of cases and the lack of after-care.

The selection of the proper case for operation and the age for operation are two of the most important considerations in this subject. I believe that those who have been doing this operation for a long time have learned from experience to postpone the date of operation to the older periods. Personally, I believe that whenever possible we should avoid performing tendon transplantation until the child has obtained its growth, for the reason that during growth, with the unequal pull which must be left in any paralyzed foot, we have already a tendency for the recurrence of deformity, or the development of a new one. On the other hand, if we wait until growth is obtained, and this element is eliminated, we have then a much larger possibility for success. One can almost make a rule that if deformity can be prevented or held we should treat conservatively until the time when we think the patient has obtained his growth in order to get this permanent result. This does not mean that sometimes operations must not be done in the earlier periods, but we must recognize that failure often comes from operation at too early a period, and the failure is due to this rather than the failure of the operation to obtain the object desired.

Another very important caution is that we should not feel that the operation finishes the treatment. This has also been a cause of failure many times in operations which themselves have been successfully performed, but by those who have not recognized this important element in all orthopedic work. So often the treatment in orthopedic work can be considered as beginning when the operation ends. We must realize that a case needs after-care and after-treatment fully as much as in the post-operative stage, and that as much as this is recognized, one may expect a larger measure of success.

Dr. Roberts (closing.)—The province of the paper was simply tendon transplantation, and not other procedures, which we know are important. But I could not cover all that, and I wanted to adhere especially to selection of cases, tendon transplantation, and after-care. We all know that other operations have to be done, and I tried to sum it all up in one sentence by saying that all obstructions should be removed, including the correction of deformities.

I said that at least two years should elapse before the operation in infantile paralysis. As a rule, I do not think two years is sufficient, but at least two years should go by.

The end-results and their failures prompted me to write this paper. The causes of failure, in most of them, can be attributed to these three things: poor selection of cases, poor operative technic, and poor after-treatment, that is, not carried over a long enough period of time.

One thing I want to mention that Dr. Bennett brought out regarding the placing of the transplanted tendon in the sheath with the original tendon. If you feel that the tendon will never recover, then it is much easier to remove it rather than try to get the new tendon through with the old one. I believe that unless a tendon has a chance to come back it should be removed.

X-RAY VS. RADIUM IN THE TREATMENT OF UTERINE HEMORRHAGE*

By Jackson W. Landham, M.D.,
Atlanta, Ga.

The term uterine hemorrhage without qualifications would necessarily apply to any pathological condition of the uterus characterized by the presence of hemorrhage, but it is the purpose of this article to limit its application to uterine fibroids and myopathic bleeding. Purely operative treatment in these conditions should be strongly condemned, as the dangers from embolus, narcosis, infection, shock, hem-

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orrhage, or secondary injury cannot, even with present-day technic, be entirely excluded.[1] The primary mortality due to radiotherapy is practically nil.

Myopathic bleeding from the uterus represents a condition the manifestations of which may indicate multiple pathology which is variously termed hemorrhagic endomtritis, chronic metritis, subinvolution of the uterus and uterine arteriosclerosis.

Radiotherapy accomplishes a cure in these conditions by direct action on the individual cells by producing an endarteritis resulting from the action on the endothelial cells of the blood vessels and lymphatics, and by the destructive effect that it has on the Graafian follicles of the ovaries.

There is no other class of patients in whom the diagnosis should be so well determined as the class of patients considered in this paper. In uterine fibroids we should know whether they are single, multiple, submucous, intramural, subserous, pedunculated or calcareous. In myopathic bleeding we must rule out the presence of malignancy, cervical and uterine polypi, inflammatory diseases of the adnexa, lacerations, uterine displacements and extrauterine pregnancy. Cases that do not respond satisfactorily should always arouse a suspicion that the original diagnosis of a benign metrophathy may be erroneous. A preliminary curettage for diagnostic purposes is an essential part of the examination in cases where the pelvic examination does not establish the diagnosis.

In the selection of cases for radiotherapy we should consider age, sexual functions, type of tumor and complications. Radiation is not absolutely contraindicated in young and middle aged women except in cases where the sexual function has not been established or where there is a desire for children. Multiple fibroids requiring surgical removal of the uterus are proper cases for radiotherapy. Women who have undeveloped sexual functions should be treated surgically. [3]Pedunculated fibroids are surgical on account of the danger of degenerative changes due to torsion of the pedicle and the ease with which they are removed surgically without removal of the uterus. All patients who have active tuberculosis, heart or kidney lesions, or who have lost blood to the extent that there is grave secondary anemia present should be treated by radiotherapy. In considering the contraindications to radiotherapy in uterine hemorrhage, we should realize that if it be necessary to produce a premature menopause this will be much better tolerated by the patient than a menopause resulting from oophorectomy.[4] We must also consider the fact that fibroids and myopathic bleeding may frequently be cured by radiotherapy without producing the menopause or destruction of the internal secretion of the ovaries. Absolute contraindications to radiotherapy are necrosis, cystic or calcareous degeneration, large adherent fibroids producing pressure symptoms demanding immediate relief, pelvic inflammations, pedunculated tumors and malignant complications of the body of the uterus. Malignancies of the cervex uteri show a higher percentage of cures when radiotherapy is employed than they do when treated surgically.

A comparison of results obtained by Roman Schmidst with radio-active substances and roentgenotherapy in uterine fibroids and myopathic bleeding shows that out of a total of 2441 cases treated clinical cure was obtained in 2359 patients (96.62 per cent). Roentgenotherapy produced a clinical cure in 1.6 per cent more cases than did treatment with radioactive substances.[5] Of a total of 3748 myomas treated by both methods together, clinical cure was obtained in 3417 cases (91.08 per cent). Irradiation with radio-active substances gave 2.9 per cent more clinical cures than did roentgenotherapy. Considering apparent cure, disappearance of tumor and the attainment of amenorrhea, irradiation with radio-active substances gives better results than roentgenotherapy. The latter, however, is to be preferred in view of the recurrences, improvements, refractory cases, deaths and clinical cures.

Since there is a direct effect upon the individual cells, and an endarteritis in addition to the effect on the Graafian follicles, it is possible in roentgenotherapy to protect the ovaries and treat over the uterus to correct the hemorrhage. Many

cases managed in this way have responded very satisfactorily. However, we cannot be certain that an artificial menopause will not result, due to scattered radiation reaching the ovaries. When radium is used in the treatment of these conditions there is nothing to protect the ovaries except distance from the point of application and the limit of the period of treatment. Frequently there develops a very irritating leucorrhea following the intrauterine application of radium which does not follow roentgenotherapy. Many patients who are referred to us for radiotherapy to control myopathic bleeding have had a diagnostic curettage and they are not willing to take an anesthetic and be hospitalized to be treated with radium. This is not necessary in x-ray therapy.

The technic to be followed in these cases varies, depending upon whether it is desired to accomplish a permanent menopause or to endeavor to carry the treatment to a point that will control the hemorrhage without destroying the function of ovulation.

If a permanent menopause is desired, the anterior and posterior surfaces of the pelvis are divided into four areas, two anterior and two posterior. These areas are treated for ten minutes each, using four millimeters of aluminum as filters, ten-inch skin target distance, five milliamperes of current and a nine-inch spark gap. Separate sittings are used for the anterior and posterior surfaces in order to prevent nausea and vomiting. Two such treatments are given at intervals of three weeks. The patient is then instructed to go for two months without treatment so that a sufficient time will have elapsed to determine the results of treatment. This plan of treatment would not be satisfactory in a patient who was losing blood rapidly, but in other cases it accomplishes the menopause so gradually that there are no disagreeable symptoms. If it is thought undesirable to produce a permanent menopause the ovaries should be protected by lead and the radiation directed over the uterus. In the use of radium in the management of these cases we have to depend upon regulating the dose by the number of milligram hours, thereby giving a partial or total treatment to all structures involved.

CONCLUSIONS

(1) Surgical treatment of uterine fibroids and myopathic bleeding is indicated in a very limited number of cases.

(2) An accurate diagnosis which may demand a preliminary curettage is essential.

(3) Since uterine hemorrhage may be controlled without producing a permanent menopause, age does not necessarily constitute a contraindication to radiotherapy. Women with undeveloped sexual functions, pelvic inflammations, cervical or uterine polypi, pedunculated or degenerating fibroids, malignancy of the body of the uterus or large adherent fibroids producing pressure symptoms, should be treated surgically.

(4) Statistics and my personal experience with x-ray and radium convince me that roentgenotherapy is the method of choice in the management of these cases except in patients who have marked hemorrhage. These should be treated with x-ray and radium so that a quick result may be obtained.

(5) Technic suggested contemplates a gradual menopause so that unpleasant symptoms characteristic of this period may be prevented as much as possible.

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DISCUSSION

Dr. E. C. Samuel, New Orleans, La.—In our clinic at the Tuoro Infirmary we have had occasion to make use of both radium and x-ray probably about equally. Up to the time that we obtained our first radium, about six years ago, we were using x-ray exclusively for the control of myomas. Since the purchase of radium we have made use of the radium in practically all of our cases up to within two weeks ago when we installed a new deep therapy apparatus, when we started again in selected cases to use the x-ray.

Dr. Landham spoke about the contraindications of pelvic inflammations complicating fibroids in the use of the x-ray. We have disregarded this entirely and do not hesitate now to use x-ray in the presence of pelvic inflammations in patients who require therapy for the removal of the fibroid.

It is disappointing at times to radiate a patient as thoroughly as it is possible to radiate with deep x-ray and radium, using one or the other, not completely to relieve the symptoms in so far as the cessation of hemorrhage is concerned, and to have the patient return in three or four months with practically no reduction in the size of the fibroid. Just what this is due to we do not know. In patients who were given a comparatively small quantity of radium and x-ray one may see a complete disappearance of the fibroid with cessation of the hemorrhage, the pressure symptoms and the whole train that goes with it.

One of the objections to the use of this newer 200,000 volt technic is in the possibility of the liberation of some toxic substance, which we do not at present understand, into the blood stream. There has been quite recently in some of the German journals reports of considerable trouble after massive radiation of fibroids. Up to the present we have had no trouble in that direction because we have not given the one big dose at one sitting, dividing it rather into four sittings on four different days. Up to now we have seen no evidence of roentgen sickness and the other conditions that this article called attention to.

I believe that in active bleedings radium still holds the leading place in therapy of fibroids.

The Doctor spoke of the patient's refusing to take a second anesthetic for the putting in of the radium after a diagnostic curettage. In our Infirmary at the time the diagnostic curettage is made the pathologist makes a rush diagnosis, the radium is put in, and there is no necessity for a second anesthetic. The usual technic that we have followed in the use of radium to radiate these fibroids is to insert 50 mg. in a tube made of celluloid, using two 25 mg. tubes instead of one. We place them in the uterus, leaving them in for 24 hours and in most cases we usually get a cessation of the hemorrhage and a diminution in the size of the tumor. Rarely do we have to put in a second or third application. If we have to give a second application we usually do not give an anesthetic. The patient is brought to the hospital the night before and gradually dilated with Hagar dilators.

Dr. W. P. Whittington, Asheville, N. C.—I have had no extensive experience with radium but I have had considerable experience with the x-ray. I have yet to find any failure or dissatisfaction from its use in cases of hemorrhage from any cause. Of course, a great deal depends upon the technic of administration. Hemorrhage at the menopause or from a congested uterus in younger women, may be controlled with a mild dose from a nine-inch spark gap without producing any damage to the skin. One or two doses are usually enough to cure the women permanently. In younger women the menses will return in two or three months and the patients will by that time have regained their active health.

There is one point that is generally emphasized by men who have had experience in the treatment of hemorrhages from the uterus, that is regarding the use of the x-ray in non-operative cases. If we have a case of cancer of the cervix with hemorrhage that is past the stage of radical operation, what better can we do than to give x-ray treatment? It will check the hemorrhage, relieve the pain and may cure the condition, which is better than anything we can do in surgery. Therefore, I do not object to giving my non-operative cases of hemorrhage just as deep doses as I can without producing injury. I have come to the conclusion that no advanced case of malignancy is operable. I think the time will soon come when surgery will throw up its hands and leave the treatment of these cases to x-ray or radium. Surgeons and roentgenologists will go hand in hand in cases where surgery is impossible. The day will come when even radium will be superseded by proper methods in x-ray in cancer.

We give the treatment over the liver and over the abdomen, in addition to the pelvic treatment. Treating malignancies with x-ray is not so difficult as some people think.

Dr. George E. Adkins, Jackson, Miss.—May I suggest that in each discussion where reference is made to the dosage, the man indicate what he is giving.

Dr. Whittington.—I have a machine that gives only a ten-inch spark gap. In fibroids and cancer of the uterus I use a 9½ inch gap with 10 to 14 inch distance according to the thickness of the abdominal wall, 5 ma, 5 to 6 minutes with 3 millimeters of aluminum. I always use the cross-fire method to avoid injury to the skin. I usually use three ports in front and three in the rear, and one directly to the cervix through a vaginal speculum. In order to do this I fasten foot straps by snaps to a rope passed through a ring bolted to the wall. This contrivance holds the feet up out of the way of the connecting tube cords, and the tube can be placed as near the cervix as desired, and the treatment given directly on the diseased cervix.

Dr. D. Y. Keith, Louisville, Ky.—Two years ago when the Southern Medical Association met in Louisville, I learned a great lesson from Dr. E. C. Samuel of New Orleans. He saw a patient in my office who had a large uterine fibroid. She was given x-ray over the larger tumors. She had one under the costal cartilage on the left side the size of a fetal head, one on the right side that filled practically the entire abdomen, and the pelvis was entirely filled. She was given x-ray over each of the larger tumors anteriorly and three portals posteriorly. She was also given radium. This was the second or third case of uterine fibroid that we had treated with radium and we tried to carry out the advice we got from Dr. Samuel. Since that time we have been using radium inside the uterus and x-ray exter-

nally on all large fibroids. I am sure the patients receive more benefit in large fibroids from both x-ray and radium than from either singly.

We believe that we get better results in our fibroids using four millimeters filtration, five milliamperes, nine-inch sphere gap, and the time varies entirely with the size of the tumor.

The other point that I want to speak of is regarding anesthesia. It is the rarest thing in the world that we use anesthesia for putting radium in the uterus.

In a girl of fifteen years, you have to use it because she has pain in the vagina on dilation. If you take a sharp-tooth forceps they cannot tell when you catch hold of the cervix. We demonstrated that last year in the sister of a surgeon who had had a double pneumonia, a heart lesion and a kidney lesion. He said he was sure we could not use the radium without an anesthesia. We tried it without and she had no discomfort. She has received a cure from the radium without an anesthesia's ever being administered. If you are gentle enough in your manipulations the patients will not notice the insertion of the radium. In the cases in which we are to do a curettement we usually give an eighth or a sixth of morphine beforehand.

Another thing that Dr. Samuel brought out then that was interesting to us was the point we have been trying to make in the diagnosis of fibroid cases, that is the character of the fibroid by feeling. If you have a soft fibroid it yields very readily to treatment. If you have a very hard uterus with nodular fibroids these go down very slowly and many do not completely disappear.

Dr. L. B. McBrayer, Sanatorium, N. C.—At the North Carolina Sanitarium for the treatment of tuberculosis we have adopted the policy that it is our business to relieve the patient of any disease or condition that is in any way interfering with the patient's recovery from tuberculosis regardless of what it is. We do not wait for these uterine hemorrhages to produce an anemia and it seems to me that the essayist was probably in error, if I understood him correctly, in making a suggestion of that kind. Every persistent menorrhagia or metrorrhagia in our patients is treated with x-ray very satisfactorily. We have a patient in the sanitarium now who had a persistent non-malignant hemorrhage from the uterus who had as many as four or five curettages by different surgeons. She was finally treated by Dr. Kelly of Baltimore with radium in sufficient quantity to produce the menopause. By giving small doses of x-ray and relieving the menorrhagia and metrorrhagia we do not induce the menopause, except in an older patient.

Dr. Landham (closing).—There is a considerable difference in hospital as compared with office management of patients. Anesthesia, which is often necessary in the intra-uterine application of radium, can be carried out easily in the hospital, but not with the same degree of safety in the home or at your office.

As a general proposition frozen section examination of uterine curettings is very unreliable. I am associated with a pathologist who attaches no importance to a diagnosis made from a frozen section examination of uterine curettings. It is better to imbed the curettings instead of attempting to make a diagnosis from a frozen section examination. This would necessitate a delay of several days in the application of the radium and if an anesthetic should be applied the patient would have to go through with this a second time.

I stated in my paper that malignancies of the body of the uterus were primarily surgical. This is due to the fact that malignancies of the body of the uterus are rather slow to metastasize and it is better to do a surgical removal of the uterus in the form of a sub-total hysterectomy than it is to depend upon radiation therapy. On the other hand, cancers of the cervix are primarily cases for radio-therapy because the results are better where efficient treatment with radium and x-ray is given.

I have not found it easy to apply radium in the uterine cavity without an anesthetic. I have applied it without an anesthetic in women who have borne children, but it is not a very easy thing to do, especially where your radium is well filtered to prevent the irritating leucorrhea that follows the intra-uterine application of improperly filtered radium. Of course, you can take the tubular form of applicator and apply it in the cervical canal with ease if you do not filter

EYE, EAR, NOSE AND THROAT

VACCINE TREATMENT OF VERNAL CONJUNCTIVITIS*

By John F. Townsend, M.D.,
Charleston, S. C.

The nature and mechanism of the symptom group known as vernal conjunctivitis is still obscure. Text books add little to our real knowledge of this condition. But a diligent reading of all the literature upon it and allied subjects seems to throw some light upon it.

Fuch in his text book of "Ophthalmology" gives little on the etiology except the seasonal exciting factor; but why under similar seasonal conditions some people develop vernal conjunctivitis and some do not, he does not even try to explain.

(1) Whether they do or do not develop it depends, I believe, upon whether or not they have an anaphylactic sensitization to the antigens of vernal conjunctivitis. I believe vernal conjunctivitis is an anaphylactic reaction similar to that of hay fever, asthma, and sometimes to some types of urticaria and eczema.

(a) That asthma, hay fever, etc., are anaphylactic conditions, can easily be proven.

Dr. Lathan and Dr. Coke, in an article on "Sensitization in 270 Cases of Asthma," in the *Practitioner*, August, 1922, says that

"It is now established that there is a close analogy between experimental anaphylaxis and hay fever, asthma, urticaria and other similar complaints."

Dr. C. W. Hollopeter, in his book on "Hay Fever, Its Prevention and Cure," April, 1922, says that

"The anaphylaxis theory to explain the phenomena of hay fever and asthma is accepted by a majority of investigators."

Frank Coke, in "Asthma and Anaphylaxis" (*British Medical Journal*, March 11, 1921), says that

"Asthma, hay fever, urticaria, eczema, migrain, etc., have many common traits and will probably be proved eventually to be symptoms of anaphylaxis and not separate diseases at all."

Francis M. Racheman, in "The Mechanism of Hay Fever," in *Archives of Internal Medicine*, August 15, 1922, says that

"The hay fever mechanism is worthy of careful study for the reason that it is quite typical of a group of clinical symptoms presumably due to a natural sensitiveness to some foreign protein."

(b) As hay fever and asthma, etc., are anaphylactic conditions, they can be produced by the proper antigen at any season of the year.

That an anaphylactic reaction can be excited in a susceptible person by the injection of the exciting antigen is a principle suggested by Elliotson as long ago as 1831 (and agreed to by Phoebus, who quotes experiments made by Kirkman in "Der typische Fruhsommer-Katarrh," p. 137). This is agreed to by Coke (*British Medical Journal*, March 21, 1921); also by Scheppegrell (April, 1922); H. K. Detweiler and C. W. Hollopeter (April, 1922). This anaphylactic reaction can occur even in mid-winter. Furthermore, C. W. Hollopeter says in this connection that

"The hay fever condition passes to the asthma condition, which each year becomes earlier, finally becoming perennial, the attacks occurring at all seasons, without reference to the presence of pollen in the air."

Scheppegrell, April, 1922, says that

"Immunity is frequently relative. A patient may live many years with no attack until overwhelmed by some exposure. Then even if he lives in the same place where he was heretofore immune he develops the disease yearly."

I have found vernal conjunctivitis also to occur at any season, and am now treating a case which has had vernal conjunctivitis more or less constantly during all the seasons, having started in the fall about three years ago. This case had marked circumcorneal heaping, which is becoming less marked under the influence of vaccine injections. The itching disappeared in this case very promptly.

(c) There is an association between vernal conjunctivitis and other anaphylactic conditions.

De Schweinitz, in his book on "Vernal Conjunctivitis," says: "It may accompany the disease known as hay fever." In a case of hay fever that I recently saw, the vernal conjunctivitis symptoms were

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

typical. This case was relieved by vaccine injections. Dr. Cord, in speaking of afenil for vernal conjunctivitis, in part says:

"The mode of action of afenil is not very well understood, but it has been effective in vernal conjunctivitis, bronchial asthma, urticaria, and the prevention of anaphylaxis and hay fever."

He thus classifies vernal conjunctivitis with these other conditions. The more I have read on this subject the more I find a similarity between vernal conjunctivitis and anaphylactic conditions.

H. H. Dale (in "Specific Sensitiveness and Anaphylaxis," *British Medical Journal,* January 14, 1922) says that

"The anaphylactic shock is manifested in various ways in the different animals. In the dog it is gastro-intestinal, in the rabbit it is cardiac, in the guinea pig it is bronchial and in man, a more complex animal, it is still different. But in all there is this similarity that in each there is an eosinophilia."

In vernal conjunctivitis there is also an eosinophilia. Drs. Lathan and Coke say that "In anaphylaxis there is a definite eosinophilia." Brown Pusey (*Jour. A. M. A.,* 1911, LV ii, 1207), in an article on "Eosinophile Cells and Pollen in Vernal Catarrh," says:

"In April, 1911, I reported a finding of eosinophile polymorphonuclear leucocytes in smears taken from a series of cases of vernal catarrh confirming Herbert's discovery. Interested in this finding and knowing the many points of similarity between vernal catarrh and conjunctivitis of hay fever, I have been led to the examination of smears taken from a series of cases of the conjunctivitis of hay fever, where I found eosinophile polymorphonuclear leucocytes in great abundance. Indeed, the cellular content of a smear from one disease is the same as that from the other. This observation shows another, and possibly very important, similarity between the two diseases. We know that the conjunctivitis of hay fever is due to pollen. From observation of eosinophile cells in the conjunctival secretion of hay fever, we know that pollen may cause an inflammation of the conjunctiva, with secretion containing an abundance of eosinophile cells. This fact becomes of increased interest when it is realized that eosinophile cells are negligible factors, as is shown by my previous work in smears taken from all ordinary forms of conjunctivitis. It is in the field of the etiology of vernal catarrh (an unknown field) that the finding of these cells in hay fever is of interest. I venture to think that the presence of eosinophile cells in the conjunctivitis of hay fever and in vernal catarrh and their absence in ordinary forms of conjunctivitis points strongly to a similar etiological factor—pollen."

(Also see Hollopeter in "Hay Fever, Its Prevention and Cure," and Scheppegrell in "Hay Fever and Asthma.")

Conversely, we find that a non-specific protein shock as from typhoid vaccine differs from that of anaphylaxis by the absence of eosinophiles, which are always present in anaphylaxis, an additional proof that vernal conjunctivitis is an anaphylactic shock. There is also quite a similarity between the secretion of vernal conjunctivitis if examined microscopically and otherwise and that of asthma.[3] [4]

Berkhart, 1886, said: "Vernal conjunctivitis secretion is similar to that of asthma."

Summing up their opinions, they seem to be as follows: there is a similar and peculiar chemistry of the secretion of vernal conjunctivitis and of asthma, which peculiarity causes in asthma the twisted threads covered with mucin and sago-like globules of eosinophile cells, also twisted around it (Curschman's spirals) (Berkhart, page 48), and in vernal conjunctivitis there is a thread of similar constitution. In one case the twisted thread is due to the peculiar spiral arrangement of the finer bronchioles, which with respiration seems to cause the twisting into filaments of the special secretion present (Babcock quotes Hoffman). In vernal conjunctivitis, a similar thread-like or stringy formation, is produced by the action of the eyelids on a similar form of ocular secretion. A more brittle form of discharge would produce a foam in asthma and just a discharge in vernal conjunctivitis. The point is that there is a similarity, microscopically and macroscopically, between the discharge of vernal conjunctivitis and of that of asthma and hay fever.

In the vernal conjunctivitis of many negroes the appearance was similar to that described by Dunbar Roy (SOUTHERN MEDICAL JOURNAL, 1915; abst. *Am. J. of Ophthalmology,* April, 1916), "At the limbus there is an elevated circular and gelatinous mass, which is occasionally pigmented, to which Dr. Jackson agrees in the *Am. J. of Ophthal.,* April, 1918. I have found that the vaccines, in addition to relieving the itching, also diminish the pigmentation and hyperplasia.

I think H. H. Dale and C. H. Kellaway in "The Philosophical Transactions," Royal Society of London (series B. V. ii, pages 273-315—I am not sure of my authors) state that there is an increase of eosinophiles in the blood in anaphylaxis. Dr. Roy states that there is an increase of eosinophiles in the tissues of vernal conjunctivitis, another proof that vernal conjunctivitis is an anaphylactic condition and that treatment based on that fact will give the best benefits.

CAUSE OF VERNAL CONJUNCTIVITIS

(2) Vernal conjunctivitis is caused by other conditions than atmospheric.

Dr. J. A. Thompson (*Jour. A. M. A.*, August 23, 1919, p. 578) reports a case of recurrence of nasal hydrorrhea with marked eye symptoms with every menstruation when the patient was passing through the menopause. I have a case that formerly had typical vernal conjunctivitis every spring, which was symptomatically relieved by a weak solution of eserin. Recently her father told me that she still had the attacks, but that they came on only with her menstrual periods.

H. K. Detweiler says that the non-seasonal type of anaphylaxis is due to the protein of animal hair, food and bacteria.

Gabrielides says that vernal conjunctivitis may be a manifestation of auto-intoxication.

Scheppegrell's law is that in order for an antigen to be positive it must be capable of producing a reaction not only during the hay fever season, but at any time of the year. In other words, it must pass both botanical and physiological tests. Vernal conjunctivitis is caused at any season if the patient is exposed to the proper antigen. I have seen cases at all seasons of the year.

As spring used to be considered an exciting factor, it was called vernal conjunctivitis. Reviewing the allied anaphylactic conditions, we may find something of special interest. For instance, in about 1828, Bostock was the first to say that hay fever was due to heat. For numbers of years many agreed with him. Phoebus, in 1862 (in "Der typische Fruhsommer-Katarrh, Giessen) makes an interesting observation with respect to the seasons of the year. He considered that hay fever was due to some recondite quality possessed by the first heat of the summer which the heat later in the summer was not endowed with. In later years the heat theory was thought less of and hay fever was thought to be due to pollen. Still later it had been found to be due to some antigen to which the patient is sensitized. Heat is even now prominently advanced as the cause of vernal conjunctivitis. The first heat of summer comes in the spring. Spring used to be considered the cause of spring catarrh or vernal conjunctivitis. Many still claim that heat at any time is the cause of it. It is possible that in warm weather the antigen is more prevalent or more active. Other than that heat has no bearing upon the etiology.

Since many are exposed to the antigens that cause vernal conjunctivitis, hay fever, or asthma, and only some develop it, there must have been some previous sensitization (Hollopeter, Mackenzie 1884, Sajous 1884) of the body by a protein introduced in the blood system, which has caused the formation of a precipitating antibody located in the fixed cells. These sensitized cells have a wide distribution, but some places are more exposed to the influence of the antigen than others, these places being the conjunctiva, nasal mucosa and bronchial mucosa.

In vernal conjunctivitis the sensitiveness is due to fixed cellular antibodies.

H. H. Dale (in "Specific Sensitiveness and Anaphylaxis," *British Medical Journal*, January 14, 1922) Dr. Weil, Dr. F. Coke, Dr. Racheman and others state that

"Anaphylaxis is due to the formation of a cellular antibody of the precipitin nature."

"It takes some time after the injection of the protein for these cellular antibodies to form, but with the complete formation the animal is sensitized"—(Hollopeter).

The antibodies then have disappeared from the blood and become intracellular. Coke calls it an antigen antibody reaction. Scheppegrell, April, 1922, says that

"An increased susceptibility to hay fever after the initial attack is due to the sensitized condition resulting from the absorption of the pollen protein. The antibody resulting from this reaction is probably of the anaphylactic type, which favors a reduced resistance to further sensitization."

Given a patient sensitized, H. H. Dale, Noon, Freeman and others state that the antigen acting upon the antibodies in the fixed cells of the sensitized patient causes the anaphylactic symptoms. The types of symptoms vary according to the locality affected. In the conjunctiva there is vernal conjunctivitis; in the nose, hay fever, etc. Places are more frequently affected that are the more exposed.

H. H. Dale and C. H. Kellaway, in "Anaphylaxis and Anaphylotoxins" (*Philosophical Transactions,* Royal Society of London, series B. V. ii, pp. 273-315) say:

"Direct evidence is presented in favor of the view that anaphylaxis is produced by an antibody in the cells of the tissues. The same antibody, when free in the circulating blood or in the fluid surrounding an isolated muscle, has a protective function."

The idea of cellular antibodies and circulating antibodies was first suggested by Yonge, who called them endo- and exotoxins ("Treatise of Hay Fever and Sneezing," 1910) and by Carl Oppenheimer. So the idea is not absolutely new, but it has been emphasized in many papers of 1922. Drs. A. Lathan and F. Coke ("Sensitization of 270 Cases of Asthma," the *Practitioner,* August, 1922), as a result of experiments, state:

"The anaphylactic irritation is located in the cells of the tissues and not in the blood, as is proven by the bronchial spasm present in the lung, even after it is washed free of the blood, which spasm occurs when the lung is perfused with the solution of the original protein."

This experiment proves what Sir Andrew Clark denied in 1886.[14 17 28]

There is much written on the cellular location of the sensitizing antibody, but the above expresses the view clearly and concisely.

Bacterial vaccines benefit these types of cases, but as to the exact way that the vaccines furnish their protection there is also some difference of opinion. Two main views are held: (1) that the benefit is due to the tonic effect of the vaccine; (2) that it is due to an immunizing influence produced by the bacterial vaccine's causing an increase in the circulating antibody, which circulating antibodies afford protection.

The tonic effect view is put forward by Dr. C. H. Sherman in "Site of Antibody Formation" (*Am. J. Clin. Med.,* July, 1922) and also by Dr. I. M. Mullich (*Calcutta Medical Journal, August,* 1911). This view is best discussed by Dr. V. Dabney (*New York Medical Journal,* Feb. 10, 1912, p. 275), who offers a plausible explanation of the tonic effect of vaccines by means of Ehrlich's side chain theory. Now with regard to the immunizing influence[2] of vaccine injections by increasing antibody formation, Dr. F. M. Racheman in "Mechanism of Hay Fever" (*Archives of Internal Medicine,* August 15, 1922), speaking of the difference between allergy and immunity, says that

"In allergy the antibodies are predominately in the fixed cells. This is when the patient is sensitized. . . . But in immunity the antibodies are predominately in the circulating blood. The patient is then protected and will show no symptoms even if the antigen is injected."

The vaccines benefit by increasing the antibodies in the circulating blood. As to the mechanism by which these bacterial vaccines cause an increase of circulating antibodies, there is also some difference of opinion. Dr. Danysz and Dr. Sherman claim that their beneficial effect is not due to their protein content. The other group of doctors, Dr. Coke ("Asthma and Anaphylaxis," *British Medical Journal,* March 21, 1921), Dr. H. H. Dale (*British Medical Journal,* January 14, 1922), and Dr. F. M. Racheman (*Archives of Internal Medicine,* August 15, 1922), held that the protein and not the toxic value of the vaccines is the cause of the circulating antibody formation. Dr. Sherman says: "The production of anaphylaxis varies inversely with the toxicity of the infection."

This excess of circulating antibodies catch whatever happens to be the antigen that produces vernal conjunctivitis, hay fever, asthma, etc., and put it out of action before it reaches the sensitized cells. When this excess of circulating antibodies is used up the sensitiveness returns. I recently saw a case which illustrated this. The patient was to return for another injection in four days. He returned in ten days, stating that seven days after his last injection the ocular symptoms had returned. Summing up opinions, we may say that given a condition of sensitiveness to an antigen, or given a case sensitive to the causative factors of vernal conjunctivitis, vernal conjunctivitis will not be produced if the proper circulating anti-

bodies are made to circulate in the body fluids. Such circulating antibodies can be produced by the injection of vaccines. I have been using the kind of vaccines used by Dr. Scheppegrell in New Orleans, La. He states that the organisms that cause hay fever are the micrococcus catarrhalis, Friedlander bacillus, pneumococcus, streptococcus and the staphylococcus aureus and albus. Mulford's serobacterin may be better than the other forms of vaccines on account of the increased proteins it contains. Dr. A. Vander Veer, Jr., in "The Present Status of the Treatment of Hay Fever and Asthma" (*Am. J. Med. Sc.*, July, 1922), from a summary of 2000 cases, says that we must learn to discard the word "cured." We may have to do the same thing with regard to vernal conjunctivitis, but we should by use of allergens determine if possible the causative antigens and remove them, and try to immunize against those that cannot be removed.

Dr. Jackson (*Am. J. of Ophthal.*, April, 1916) gives a very complete view of vernal conjunctivitis, classifying various etiological and other factors. I am not going to take up your time giving you my classifications, but conclude with a summary of the treatment.

PRESENT TREATMENT OF VERNAL CONJUNCTIVITIS

℞ Tannic Acid.....1% or less
or ℞ Ichthyol. .....1% or less
or ℞ Sod. Hypersulphate .....1% or less
or ℞ Pot. Chlorate .....1% or less

I have found eserine grs. ⅛ oz. 1 of benefit in some cases.

To these may be added the treatment by x-ray or by radium, both of which have some dangers connected with them, as I have seen even when used by skillful hands. I heard of one case in October of this year where the hair follicles of lids were destroyed. I am hoping that the vaccine treatment may be found more successful and less dangerous.

CONCLUSIONS

(1) Vernal conjunctivitis is an anaphylactic condition.

(2) As vernal conjunctivitis has an antigen as its etiological factor, we may say that:

(a) The predisposing factor of vernal conjunctivitis and allied anaphylactic conditions is a cellular antibody of the precipitin nature, producing a sensitized patient.

(b) The exciting factor is some antigen.

(c) The protection is furnished through circulating antibodies produced by vaccines neutralizing in the blood the exciting factor.

(3) Since vernal conjunctivitis is an anaphylactic condition, cases of vernal conjunctivitis should be tested out with allergens, just as cases of asthma and hay fever are now tested.

(4) Treatment based upon these tests may be found even more effective than the vaccine treatment.

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DISCUSSION

Dr. K. W. Constantine, Birmingham, Ala.—Vernal conjunctivitis is a very rare disease in the vicinity of Birmingham. The few cases that have come under my observation gave a history of having had treatment from one to several years with strong caustics, and with marked distress in every way. By looking after the general condition of these patients and using mild local medication, especially dilute acetic acid, they are often relieved of the symptoms. As yet I have not used any vaccines in these cases, but I believe there is indication for this procedure.

Dr. Phinizy Calhoun, Atlanta, Ga.—There is strong clinical evidence, according to the investigations of Fort of Atlanta, that vernal conjunctivitis is due to a local seasonal irritant. In our clinic the disease is common in the negro child, both in the pure-blooded and the mulatto, commencing at various times in the spring, and depending, we think, upon how early the flowers bloom.

Fort's idea is that there is a similarity between vernal conjunctivitis and hay fever, and upon this hypothesis he uses the commoner plant vaccines. In most instances he obtains a distinct focal reaction, but from the use of no constant pollen.

His treatment, besides a local wash of zinc sulphate solution, has been the subcutaneous injection of pollen vaccines, with an apparent improvement. An eosinophilia (both local and general) is the only constant laboratory picture in vernal conjunctivitis, and it is commonly known that certain local irritants, notably powdered ipecac, commonly used by soldiers to induce a conjunctivitis, will produce it. It is therefore reasonable to believe that pollen or plant irritants may be the responsible factor in the causation of vernal conjunctivitis.

While the thought expressed in Dr. Townsend's paper is in the experimental stage, it is well worth considering. In the meantime, until this or some other idea can be developed, I employ radium as the only therapeutic agent which will definitely cure vernal conjunctivitis.

Dr. W. E. Driver, Norfolk, Va.—At the meeting of the French Medical Society in Strasbourgh in March of this year there was a symposium on anaphylaxis, in which what we know and what we do not know about anaphylaxis was pretty well threshed out. It seemed to be established there that we can get away from the idea that anaphylaxis is solely produced by the interaction of antigens and antibodies. Such men as Widal, Richet and Bordet have established that you do not necessarily need a nitrogenous substance to produce anaphylaxis.

In 1913, Bordet showed he could produce most marked anaphylactic conditions with agar agar, and Widal showed that we could have definite anaphylaxis from cold. As demonstrated by one of Widal's patients, an anaphylactic condition not only was produced by aspirin and antipyrin, but also by polyps in the nose. When these polyps were removed asthma ceased and when the polyps came back asthma returned. The same patient had asthma from the emanation of sheep.

We know definite auto-anaphylactic conditions from x-ray, heat and cold. I should like to mention a patient who was referred to me because his ears stopped up if he took a cold bath, or washed his face in cold water. I immersed his hands in cold water and found on examination that he had a typical edematous condition of the eustachian tube and middle ear. The history he gave was definite. He said he had abandoned bathing his hands and face in cold water. Such reaction to cold is not new. Murri described a similar condition in some papers published from 1880 to 1886.

I think Lumiere's hypothesis as to colloids and the unstable colloidal equilibrium in some persons who may be upset by x-ray, heat, cold, pollens, pretein, etc., is worthy of consideration. Therefore how can you tell whether vernal conjunctivitis is due to pollen of the spring time or to heat? I have seen these cases clear by the use of cold applications. I cannot see how we can definitely treat these cases by vaccines. It would be more rational to go back to the idea of using the person's own serum in small doses and not allowing enough time to elapse to produce anaphylactic shock. This treatment suggested by Besredka seems far more rational to me than the use of haphazard pollen vaccines.

Dr. Townsend (*closing*).—Colds, of course, are one of the causative factors. As you find an increase in the variety of bacterial causes and of food and of plant antigens, you find that you have just so many more antigens to test the sensitiveness of your patients for.

In acute attacks of hay fever, the bacterial cause seems to have a great influence, because you first reduce the acute attack by bacterial vaccines and then desensitize them by pollen extract.

CONSERVATISM IN NASAL SURGERY*

By W. W. Potter, M.D.,
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I wish to bring to your attention and discuss in a general way some of the most common pathological conditions seen in

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

the nose, the most frequent operative procedures instituted for the relief of these conditions, the after treatment and end results.

Man is not so dependent on the sense of smell as a guide in selecting the proper food for the body, or for protection, as some of the lower animals; therefore, the most important function of the nose is the receiving, purifying and warming of the air we breathe. Anything, be it foreign body, polypi, deviated septum, or hypertrophied turbinals, that in any way interferes with this function is a menace to the health and welfare of the individual, and should be removed, or corrected.

When we speak of intra-nasal disease we usually mean sinus disease. Diseases of the accessory sinuses account directly or indirectly for practically all of the intranasal operations that are performed, and the pathological conditions necessitating these operations are in practically all instances caused by some obstruction or interference with the natural drainage and ventilation of these accessory cavities, the removal or correction of which will result in the relief and cure of most cases. However, many of us have been, and some still are, too enthusiastic in operating upon nasal pathology.

I take it we are as one in the belief that the main object of these operations is to establish proper drainage and ventilation of the nose and accessory sinuses. Therefore to accomplish this with the removal or destruction of as little tissue as possible should be the aim of every nasal surgeon.

It has always been a simple matter to remove the middle or the inferior turbinate, and in spite of the fact that this operation is rarely ever necessary or indicated, some of us continue our ruthless destruction of these most important structures. Some operators maintain that the loss of the middle turbinate is of little consequence, and they invariably remove it before any ethmoid operation. With a few exceptional cases this is possibly excusable, but as a rule it is unnecessary, and radical in the extreme. Pratt maintains that it is unnecessary in ethmoid operations, and suggests that the middle turbinate be infracted and pushed to one side, and replaced when the ethmoid operation is finished. I heartily agree with him in this instance.

It is sometimes necessary to remove certain portions of the turbinates, such as hypertrophies of the posterior tip of the inferior, or the anterior superior tip of the middle turbinate preceding intra-nasal frontal sinus operations, or possibly the anterior tip of the inferior turbinate when a large opening is desired into the maxillary sinus, but care should be exercised to preserve as much of these structures as possible. A nose without turbinates will eventually become dry and scaly, and upon inspection will remind one of looking into a rusty gun barrel. It is about as serviceable as far as its chief function is concerned, and in addition troublesome pharyngitis invariably follows.

In our clinic we see a goodly number of negro patients, black big nosed individuals, in whom I have often observed a condition of the inferior turbinate which I believe to be peculiar to the negro. These are large spongy cauliflower-like masses that completely block the nares, and in some cases project into the phaynx. The turbinal bone proper is of the same soft spongy nature, and nothing short of complete removal of these masses will afford the patient relief. Most of these patients show a positive Wassermann, but the protracted use of anti-syphilitic treatment does not restore the turbinates to normal. And owing to the fact that the majority of our negro patients show positive Wassermann reactions, regardless of this particular condition, we have been slow to believe it to be due to syphilitic infection. Tuberculosis is also common among negroes, but we have been unable in these cases to diagnose tuberculosis in the lungs, or elsewhere, and cannot believe it is a primary tuberculous infection. It differs from the papillary hypertrophy of the turbinates, which is frequently seen, in that the hypertrophy is not confined to either end, but extends throughout the entire turbinate body, and was confined to the inferior turbinate in all of these cases. However, from a histological standpoint, there is some similarity in that in both there is marked hyperplasia of the fibrous tissue in the subepithelial layer, with considerable edema. In a period of twelve years I have never observed this particular condition of the inferior turbinals in a white patient, and therefore have concluded that it is peculiar to the negro. In

this particular type of case only have I ever found it necessary to remove the entire lower turbinate, and then only after repeated cauterizations failed to restore the turbinals to normal.

A deflected septum is the direct or indirect cause of practically all intra-nasal diseases, and were it not for this most common deformity, we, as rhinologists, would cease to be of very much use in our communities. The septum is deflected either from trauma or faulty development, and in either case if there is a marked deflection, the turbinates are sooner or later involved, preventing the proper aeration and drainage of the sinuses, consequently sinus disease is very likely to be the result. The sub-mucous resection is the only operation to be considered for the correction of the deviated septum, and I have nothing but praise for this operation when it is indicated, and when it is properly performed. But there are outstanding indications for it, and we should be careful that our enthusiasm for it does not interfere with our best judgment as to when it should or should not be done. A nose with a perfect septum is very rare, and there are a great many persons with more or less marked deformity of the septum who never develop symptoms which would justify a sub-mucous resection. We should have in mind indications, and contra-indications, and practice conservatism in selecting cases for this operation. A well-performed sub-mucous resection will facilitate drainage and ventilation of the ethmoids, and frequently relieve the patient of symptoms such as headache, sneezing, ocular disturbance, etc., which are attributable to ethmoid disease, and oftentimes render an ethmoid operation unnecessary.

As stated above, sinus disease accounts directly or indirectly for practically all intra-nasal operations. The ethmoids are more frequently involved than any of the sinuses, and not infrequently suppuration in adjacent sinuses ceases very soon after the ethmoids are opened and drained. This well-established fact should encourage us to deal more conservatively with some of these sinus conditions than we have been accustomed to in the past.

All of the classical ethmoid operations described and illustrated in the literature and text books are radical operations. They contemplate the complete exenteration of the ethmoid cells, and even the removal of the immediate adjacent normal tissue. Some rhinologists advocate this in all cases of suppurative ethmoiditis; but to my mind the results obtained do not warrant such a radical procedure. The majority of these cases will respond most readily to more conservative measures, such as the correction of any deformity of the septum or middle turbinate to insure the proper drainage, the intelligent use of suction and irrigation, and the proper attention to the diet. The diet I believe to be most important if the patient is a child. Sinusitis is not so rare among children as we formerly thought. It is very common in certain sections of our country. The removal of tonsils and adenoids will clear up about 90 per cent of sinusitis in young children, and practically all of the other 10 per cent will be cured by irrigation or suction, or both, with proper attention to diet, if the climatic conditions are good.

No infant or young child should be subjected to any sinus operation except as a last resort, or until all other measures have failed. The diagnosis should be clear, and the prognosis well guarded. In adults where it is deemed advisable to attempt complete exenteration, it is impossible for most of us to know whether or not we have removed all of the diseased cells, and this fact accounts for the two or more operations necessary in practically all of these cases before a cure is obtained. When the removal of all the cells is contemplated, Reeves has called attention to the importance of conserving the muco-periosteal membrane, and to do this it is necessary to use a biting forcep guided by sight, rather than a curette guided by the sense of touch. It is well to remember that one can be conservative and still remove all of the diseased cells or polypi that present themselves to view. A radical operation on the sphenoid sinus is very seldom necessary except in rare instances where serious complications arise.

The diagnosis in sinus diseases is very important, and to determine the proper treatment in some cases is very difficult. The radiograph is of value only in determining the size of the sinuses, and should be had in all cases where operation is contemplated. Transillumination is of some value as an aid in diagnosing frontal or

maxillary sinus disease, but of no value in diagnosing ethmoid or sphenoid disease. Stucky's remark that the presence of a little pus in the nose is no indication for a surgical operation is a wise one, and should be borne in mind by every one who is called upon to diagnose and treat intranasal pathology.

DISCUSSION

Dr. W. T. Patton, New Orleans, La.—One of our men, a good man, reported 16 radical frontal sinus operations in one year. The rest of the hospital had had one. He showed that he had an idea he could do this operation and he was going to do it. The older men grow and the more experienced the less do they do radical work in sinuses.

A proper sub-mucous operation is one of the best operations we can do, without sacrificing important structures. I want to emphasize "proper" sub-mucous operation. If it is not done entirely you will not get good results. Every bit of deformity that is causing lack of drainage must be corrected. In many septum cases you are surprised to find how much deviation there is after the tissues are shrunken. You usually have to go back to the sphenoid bone to get an absolute correction of the septum. I am not always so radical, but when there is a deformity, I correct it by sub-mucous. If you leave a little deviation it throws the membrane out of balance all the way back.

I do not believe in the sacrificing of a turbinate. The simple method of fracturing the middle turbinate will often answer. The same thing will hold true in the inferior turbinate.

I believe in all radical sinus operations we have trouble. They all come back every time they catch cold. We can expect it. The wound is bound to fill up either with granulation tissue or scar tissue, and every time they get a little infection the sinuses give trouble again.

I had one case, a negro with blocked nose. I did everything to his inferior turbinate, but could not get room. He had a slight deformity of the septum, and I thought by removing the septum I could possibly get rid of this condition. I did a sub-mucous, or attempted to, worked three-quarters of an hour. I never did find any bone or cartilage in his septum. I saw another case like that. It would be interesting to know whether the negro has cartilage or bone in his septum. I finally had to cut off part of the inferior turbinates.

Dr. John J. Shea, Memphis, Tenn.—It is all right to be conservative before you operate. Give treatment a good chance; look after the endocrines, diet, and all that; but when you do operate, do sufficient work to get results.

There are two or three things I think important to do. In the first place, the ventilation must be good from before backwards. In the army we saw hundreds of men who had two sub-mucous operations. You could put in the nasal speculum and have an apparently ventilated nose because the part that was pushed back by the speculum was obstructing their breathing. You cannot always start the incision inside of the cartilage. Quite often the front piece of that cartilage must be taken off and the front door opened to get any air into the nose.

When a septum is replaced in the median line and comes into contact with the middle turbinate of its previous concave side, it is best to amputate this turbinate. Otherwise, the patient will merely have exchanged an obstruction on one side of the nose for an obstruction of the other side.

In ethmoid work, remove the middle turbinate completely and give it a chance, and then you will get results. If you do go into the ethmoid cells, like the mastoid, it must be done completely. There is no half-way operation on the ethmoids. In order to be sure that you have all the cells open, you must start back at the sphenoid and from the anterior wall of the sphenoid open up all the posterior ethmoid cells and come forward and take off the uncinate membrane. Be conservative the day before you operate, but when you do operate, do what is required.

Dr. Robert W. Bledsoe, Covington, Ky.—Ten or twelve years ago it was not at all uncommon for men doing nasal surgery to remove almost the entire inferior turbinate. Many times I have seen a piece of inferior turbinate a half inch in thickness and two or three inches long removed. I think today surgical procedure of that sort is very rare, but a paper on conservatism is timely.

I would like to call attention to one point regarding submucous operation. Within the last year or two I have seen a number of atrophic rhinitis cases with tremendously deflected septa, the principal focus of infection occurring on the enlarged side of the nose. In other words, the badly diseased side was on the concave side, whereas the good part of the nose was on the convex side. I recall one I have on hand now in which I would consider it bad surgery to do a submucous resection. The concavity is on the left side, the convexity on the right. On the concave side there is practically no middle nor inferior turbinate. The nasopharynx and, I believe, the eustachian tube, are almost completely scar tissue instead of normal mucosa, and there is infection of the eustachian tube and middle ear. This man is very anxious for relief. I have promised him relief on one condition, and that is if I can build up the septum. If I can create a deflected septum on the left side as I have on the right, I believe that will do this man a great deal of good; whereas, if I were to do a submucous resection and remove the convexity from the right side, I believe his trouble would not only be on the left side, but progress to the right side.

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DR. M. Y. DABNEY, Editor
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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
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PROBLEMS OF THE NEW TYPE OF DEEP X-RAY THERAPY

The introduction of the new high voltage x-ray machine has provided a therapeutic agent which has been shown to have an undoubted and often marvelous influence not only upon primary malignant growths, but also upon the secondary metastatic processes. There is a consensus of opinion among roentgenologists both in this country and abroad that it is an agent which has produced results which the old type of x-ray apparatus could not approximate.

Experience has shown that this agent is not devoid of danger, and many fatalities from its employment have resulted. Most of these ill results in the past have been caused first, by the inability of the roentgenologist to measure with any degree of accuracy the amount of radiation which will reach a given point; secondly, because not until recently were there biologic studies which furnished any conception of the amount of radiation necessary to affect a given tumor; and thirdly, because there was not a sufficient realization of the systemic effect of these rays upon the blood-forming organs.

The accurate measurement of the dosage and frequent blood examinations to determine the leucocyte count will avoid entirely the danger, which has been shown to exist, of producing aplastic anemia by over-dosage. A decided drop in the leucocyte count is an indication for the cessation of treatment for the time being; and treatment should not be resumed until the white cell count returns to normal.

Sometimes, after the patient has received these rays over a prolonged period, particularly if large areas of the body have been radiated, nausea, malaise and other minor symptoms of ill-being develop. When these symptoms occur, treatment should be discontinued. They usually disappear rapidly after the cessation of treatment.

This work is still in the experimental stage, though it has already given some remarkable results. Members of the Association have done much toward advancing it. To prevent repetition of one's mistakes, so far as possible, dosage should be described accurately for each reported case.

A method of measuring the amount of radiation given to a particular area is now available to all, and the roentgenologist who fails to avail himself of it will lay himself open not only to severe criticism, but possibly to damages. Last, but not least, his work will be of absolutely no scientific value. Unfortunately even at this late date many roentgenologists who are employing this new form of deep x-ray therapy have not availed themselves of this accurate scientific method of measurement.

ORIGIN OF MALARIA IN THE AMERICAS

The question has often been asked, did malaria exist in America prior to Columbus' discovery? We are inclined to doubt it. However, anopheles mosquitoes did exist here, the American species differing from those of the Old World; and when the parasites were introduced by European and African carriers, malaria quickly spread both from them and from the infected Indians.

The historical evidence for this is rather convincing:

(1) In the early expeditions of Europeans coming from reasonably healthful regions and simply passing through hitherto unvisited Indian country, extensive sickness is rarely recorded, except that due to hardship and starvation. This is true even when the region traversed by the expedition is now malarious and was at that time physically well suited for the production of anopheles mosquitoes, and doubtless was then producing them. In a number of such instances the absence of sickness is implied and in some specifically mentioned.

(2) When, however, a fairly prolonged stay or settlement was made by Europeans in places which are now malarious, "fevers and calenturas" very generally developed and in many cases were deadly. This was especially the case when the expeditions came from, or via, places (usually in America) where such fevers were prevalent. Even a somewhat prolonged stay at one place—as when Orellana remained "over the whole of Lent" at one place on the Amazon—did not lead to sickness when the Europeans had been long resident in regions free from malaria.

For example, (1) The implication is strong that there was no serious sickness —if there was any—in Oxenham's expedition of 1575 across the Isthmus of Darien and return until he had gone into a fairly permanent camp on the north coast in the country of the "Cimaroons," negro slaves who had run away from the Spaniards. Yet Isaac Strain of the U. S. Navy, in 1854, with all the facilities of that much later period, lost a number of his men from fevers on crossing one way and could not have made the return journey.

(2) Drake's Darien expedition, of 1572, reported no sickness until they had been long in permanent camp on the north coast of the Isthmus and practically in communication with Spanish settlements. They had been in the country about six months before the outbreak of "calenturas" showed up and that may, or may not, have been malaria.

(3) Raleigh's expedition of 1595 by boat and on foot up the Orinoco for 400 miles is worthy of mention.

To quote him, "Moreover the country is healthful; as 100 persons and more which lay (without shift most sluttishly and were evry day almost melted with heat in rowing and marching and suddenly wet againe with greate showers and did eat all sorte of corrupt fruits and made meales of fresh fish without seasoning: of Tortugas: of Lagartos and of al sorte good and bad without either order or measure and besides did lodge in the open air evry night) we lost not any one, nor had one ill disposed to my knowledge, nor found anie Calentura or other of those pestilent diseases which dwell in all hote regions so near the Equinoctial line."

He entered the river the latter part of March or early in April—was there in the rainy season—and made it his business to stop at Indian villages. This result could not now be duplicated even with quinin.

(4) Orellana's long voyage down the Amazon in 1541 entailed little (and apparently no) loss from sickness, although the

men were broken by privation and starvation before they started,—seven dying of hunger. They made at least two prolonged stops,—one of not less than 47 days near the mouth of the Napo (building boats) and one of 18 days, repairing them some months later. They had much communication—hostile generally—with the Indians and got their provisions from their villages.

At present from such a trip of over seven months, and without quinin, we should expect a loss of over 75 per cent of the expedition.

(5) The first invasion of Tabasco by Cortez, in 1519, was apparently not followed by sickness among his men; yet in 1529, when Montejo wished to use this province as a base for the invasion of Yucatan, it was so unhealthful that the Spaniards, occupying it since 1523, were on the point of abandoning it. It is bad enough now, from malaria.

(6) There were deaths, probably a number of them, in the expedition Cortez led across the wet lands of Tehuantepec and southern Campeche and Yucatan to Honduras in 1524-5; but they seem to have been due to privation and hardship rather than disease. They even ate their guides ("a strategic error," records Capitan Don Bernal Diaz) and thus lost their way. Had that country been as malarious as it is now, those Spaniards and Mexicans from the highlands had probably never reached the Honduran coast.

(7) The sanitary condition of the country adjacent to the port of Vera Cruz (Medillin) changed much for the worse both for Spanish and Indians after its occupation as a permanent settlement from, say, 1519, when it was first occupied and when we hear nothing of its unhealthfulness, to 1537 when Bishop Marroquin complained so bitterly of it.

For the second part, settlements once established in places now recognized as malarious soon or in time became unhealthful, sometimes extremely so, as Isabela, Nombre, de Dios, Vera Cruz, Sta. Marta, Martinique, the Guianas, Jamestown, Biloxi, Port Royal (S. C.), New Orleans, Savannah, etc. It is to be noted that almost as soon as these settlements in Spanish and French America were established, negroes direct from Africa were introduced.

Compare this with Africa. Europeans visiting the West Coast of Africa—even the first visitors— came away with fevers, although the visit may have been very brief. No stay on any West African river comparable to Raleigh's on the Orinoco or Orellana's on the Amazon was possible without an enormous loss of life, possibly of the whole expedition judging from the loss of staying a shorter time. When in the voyage to America vessels stopped at West African ports, whether mainland or on the adjacent islands, we find almost invariably (no expressed exceptions are recalled) that they suffered from fevers during the remainder of the voyage before reaching America. Such was the case with Hawkins, in 1567, with Drake and Carleisle, in 1588, and with very many others.

It seems highly probable, therefore, that malaria was not indigenous to North, Central or South America at the time of their discovery by the white man, and their settlement by him and the negro.

HONESTY IN SCIENTIFIC WORK

Severe criticism was heard of the false claims of a speaker at a recent large medical convention. Marvelous results in treatment were reported by one who advanced no new theories or modifications of technic to account for them. Apparently he

desired a credit which was wholly undeserved. All present were impressed with the fact that an untruth was being uttered and all felt shocked at its occurrence in a scientific gathering. This is indicative of something which might occur anywhere, but which, if it happened with any frequency, would undermine all faith in research work and make progress in medicine impossible.

Liars are indigenous to all climes and are exempt from no classes. But the idea of a physician's trying to secure unmerited glory by misstating facts is revolting.

Science in general, and the medical profession in particular, prides itself upon the fact that experiments and clinical cases are described as they occur. Enthusiasm and human limitations of the author often color the deductions, but the basic data must be accurate. Exceptions to this rule are fortunately rare.

Honesty is the fundamental virtue that differentiates the ethical physician from the charlatan. Those occasional misguided ones who deviate from this principle deserve the condemnation which they universally receive from the profession.

SOUTHERN PEDIATRIC SEMINAR

The number of small communities in the South and the remoteness of many of them from the larger centers, make the pediatric specialist inaccessible to many who would otherwise seek his services.

The need of more post-graduate courses in pediatrics for the general practitioner and the specialist has long been apparent; as the Southern physician has more and more tried to perfect himself in children's diseases.

With this in view, a few seasons ago, the Southern Pediatric Seminar was established at Saluda, North Carolina, and it has been repeated with increasing attendance for two weeks every summer since then.

The Seminar is held high up in the North Carolina mountains in connection with the Infants' and Children's Sanitarium where the climate is ideal for study and recreation, and where many infants are brought for the treatment or prevention of illness. The sick or well infant's diet is taken care of by a special diet kitchen and proper food, and pleasant surroundings permit of a rest for parents and children.

The staff is made up of lecturers selected from over the South. The Seminar fills a need and will doubtless grow steadily in popularity.

Correspondence

MEDICAL WORK AMONG THE LEPERS OF KOREA

Editor, SOUTHERN MEDICAL JOURNAL:

I have under my care at our Mission at Kwangju, Korea, 500 lepers; and as this work is done entirely by charity we are usually very short of drugs, instruments and supplies. Often physicians in the South are retiring from practice or taking up special work and have instruments that we could use to advantage. And then there are those who have instruments that are somewhat obsolete in their work but not so in ours.

Our lepers do much of their own medical work and give these 500 oil injections every Saturday. The following articles we use chiefly: hypodermic syringes that will take oil and needles for them, knives or bistouries, dental and artery forceps. We can also use, and have need for, nearly any surgical instruments, razors, caps, gowns, sheets, bandages, medical tablets, etc. In sending these they should be made up in a small bundle, well wrapped and tied, and mailed by parcel post to Dr. R. M. Wilson, Kwangju, Korea, and marked "Gifts for the Leper Hospital". Not more than eleven pounds can be sent in one package.

For the lepers we also need a sterilizer and microscope, and for the general hospital a dental chair. Write me first about instructions for sending these larger articles.

Nurses in hospitals and physicians' offices could render a great service by saving bandages and gauze, having it washed out and sent to us. We never have enough of this kind of supplies.

Four dollars per month supports a leper. Two hundred and fifty dollars will erect a brick cottage to accomodate ten inmates.

Any aid our medical friends can give will be greatly appreciated.

Yours fraternally,

R. M. WILSON, M. D.

Montreat, N. C., June 26, 1923.
Permanent address: Kwangju, Korea.
Address until August 12: Montreat, N. C.

(Editor's Note: Dr. Wilson is from the South and is in charge of the medical and surgical work of the Mission of the Southern Presbyterian Church at Kwangju, Korea. He attended the meeting of the Southern Medical Association last November and a paper read by him there in the Section on Dermatology and Syphilology on "Treatment of Leprosy" appears on page 507 of this issue.)

Book Reviews

Translations of Selected Passages from De l'Ausculatation Mediate (First Edition). By R. Theophile H. Laennec. With a biography by Sir William Hale-White, K.B.E., M.D., Consulting Physician to Guy's Hospital; President of the Royal Society of Medicine. Medical Classics Series. 4 illustrations. 193 pages. New York: William Wood & Co., 1923. Cloth, $3.75.

The great influence of Laennec's work on modern medicine is so well understood that this feature of the book needs no comment.

Sir William has written an appreciative biography. His translation is perfect in not only making us comprehend what it was the intention of the author, Laennec, to convey, but even the style has been retained.

The selections are well chosen and give a vivid idea of the great insight and industry of Laennec.

One could wish that Sir William would translate the full text, so that we might have this book with his annotations to serve as an inspiration to all of the medical profession.

Collected Papers from the Washington University School of Medicine. Vol. 1, 1921. With 347 illustration and 1079 pages. St. Louis: C. V. Mosby Co., 1923.

The volume is a compilation of the papers contributed during 1920-1921 by members of the faculty of the Medical School.

These sixty-five articles have been selected with a view to their practical application to clinical medicine. They cover a different field of medicine from the purely philosophical contribution of Dr. George Dock on "The Social Trend of Medicine" to technical papers such as that of Drs. Canby G. Robinson and George R. Herrman on "Paroxysmal Tachycardia of Ventricular Origin and Its Relation to Coronary Occlusion." Phases of dermatology, pediatrics, ophthalmology and oto-rhino-laryngology are also included, as well as certain subjects in the field of surgery and radiology.

Cerebrospinal Fluid. In Health and Disease. By Abraham Levinson, B.S., M.D., Associate in Pediatrics, Northwestern University Medical School; Attending Physician, Department of Contagious Diseases, Cook County Hospital, Chicago; Attending Pediatrician, Sarah Morris Hospital for Children of the Michael Reese Hospital, Chicago; Attending Pediatrician, Mount Sinai Hospital, Chicago. 69 illustrations, including 5 color plates. Second edition, thoroughly revised. St. Louis: C. V. Mosby Co., 1923. Cloth, $5.00.

In this very valuable little monograph, written by one who has long been deeply interested in the subject, there are a few omissions. Notably among these is one whose absence it is difficult to explain, namely, the increase of sugar in the cerebrospinal fluid as a sign of diagnostic importance in encephalitis lethargica.

The complete bibliography at the end of each chapter, as well as the appendix containing the monographs, is of great value for reference.

The book is a good one.

The Chemistry of Tuberculosis. Being a Compilation and critical Review of Existing Knowledge on the Chemistry of the Tuberculosis Bacillus and Its Products. By H. Gideon Wells, M.D., Ph.D., Director, Otho S. A. Sprague Memorial Institute; Professor of Pathology, University of Chicago and Rush Memorial College. Lydia M. DeWitt, M.D., A.M., Member, Otho S. A. Sprague Memorial Institute; Associate Professor of Pathology, University of Chicago and Rush Medical College. Esmond R. Long, Ph.D., Assistant Professor of Pathology, University of Chicago and Rush Medical College. 447 pages. Baltimore: Williams & Wilkins Co., 1923.

This book is the result of systematic work that has been done on the chemotherapy of tuberculosis at the Otho S. A. Sprague Memorial Institute since 1911. Its purpose, as stated, is to facilitate in some degree the study of the problems of tuberculosis and serve as a reasonably complete reference work on the chemical processes of interest to the student of this disease.

It is divided into three sections: Section I, The Chemistry of Acid-Fast Bacteria, by Esmond R. Long; Section II, The Chemical Changes in the Tuberculous Host, by H. Gideon Wells; and Section III, The Chemotherapy of Tuberculosis, by Lydia M. DeWitt.

The volume is primarily intended for the student who is fully familiar with modern biological and physio-chemistry. To those possessing this fundamental recent knowledge it should be of great value in outlining both the advances and lack of progress made by medical science in this branch of tuberculosis.

This highly specialized data forms a careful resume of work which has been done on the chemistry of tuberculosis, together with a valuable bibliography. Unique in its scope, it is needless to say that the book is destined to pass through many editions.

Laboratory Studies in Tropical Medicine. By C. W. Daniels, M.B. (Camb.). F.R.C.S. (Lond.), Late Lecturer on Tropical Diseases, London Hospital, St. George's Hospital, and London School of Medicine for Women; Formerly Director, London School of Tropical Medicine; Director, Institute for Medical Research, Federated Malay States; Member, Royal Society Malaria Commission in India and Africa, and in the Medical Service of the Colonies of Fiji and British Guiana; Consulting Physician, Hospital for Tropical Diseases. And H. B. Newham, C.M.G., M.D. (Durh.), M.R.C.P. (Lond.); D.P.H. (Camb.), D.T.M. & H. (Camb.), Director, Department of Tropical Pathology and Warden of Studies, London School of Tropical Medicine; late Temporary Lt.-Colonel, Royal Army Medical Corps, and Consultant in Tropical Diseases, East African Forces. 184 text figures and 7 colored plates. 576 pages. Fifth edition, thoroughly revised. New York: William Wood & Co., 1923. Cloth, $7.00 net.

This book has long been a standard in the tropics. No matter how out of the way one may find a physician in the jungles, if he has only two books, this will be one of them. The reason is not hard to find: Daniels has done laboratory work under the same privations imposed by the tropics, and hence his directions and suggestions are the result of personal experience.

The methods advised are all practical; and the authors' position in tropical medicine makes their statements authoritative. The book is a desirable addition to the library of any physician working with tropical diseases.

Diseases of the Nervous System. A Text Book of Neurology and Psychiatry. By Smith Ely Jelliffe, M.D., Ph.D., Formerly Professor of Psychiatry, Fordham University, New York, and Formerly Adjunct Professor of Diseases of the Mind and Nervous System, New York Post-Graduate Medical School and Hospital. And William A. White, M.D., Superintendent of St. Elizabeth's Hospital, Washington, D. C., Professor of Nervous and Mental Diseases, Georgetown University; Professor of Nervous and Mental Diseases, George Washington University, and Lecturer on Psychiatry, U. S. Army and U. S. Navy Medical Schools. Illustrated with 475 engravings and 13 plates. 1119 pages. Fourth edition. Philadelphia and London: Lea & Febiger, 1923. Cloth, $9.50.

This well-known text book has gone into four editions in the past eight years, which speaks for its popularity with the medical profession.

There is not the space given to psyco analysis as in former editions. Like its past editions, it is a reliable text book. For one desiring the basic principles of the subject, the book can be recommended.

Internal Medicine. A Work for the Practicing Physician on Diagnosis and Treatment, with a Complete Desk Index, in three volumes. Illustrated with 427 text illustrations and 14 in color. 2120 pages. By James C. Wilson, A.M., M.D., Emeritus Professor of the Practice of Medicine and Clinical Medicine, Jefferson Medical College, and Emeritus Physician to its Hospital; Physician Emeritus, Pennsylvania Hospital, and Physician-in-Chief to the Lankenau Hospital, Philadelphia; Formerly Captain, M.C., U.S.A. Assisted by Creighton H. Turner, M.D. Philadelphia and London: J. B. Lippincott Co., 1923.

The first volume deals with diagnostic methods and procedures from the old and well tried methods of physical diagnosis to descriptions of many of the newer procedures available to the more progressive men who have a moderate amount of laboratory equipment. In this branch, however, it is not broad enough to be of any special value to the laboratory specialist.

The second volume deals with an account of the diseases generally considered in internal medicine. The third volume is confined to treatment.

In the first volume an unfavorable impression is given by reason of the many old illustrations retained. Substitution of new cuts would give the reader a better impression from the start.

In the second volume the sections on nephritis are not up to the standards of the rest of the book. The older method of classification is adhered to throughout. No mention is made of the well recognized changes in blood pressure accompanying chronic nephritis of all types, and, too, no reference is made of the blood chemistry changes in nephritis.

In still other respects the work is not so complete as one would like. The dietetic management of the various gastro-intestinal disorders could be added to with advantage.

The work was just too early also to include the latest findings in the pancreatic therapy of diabetes.

Notwithstanding the above criticisms, one will find much that is good in these three volumes.

Epidemology and Public Health. A Text and Reference Book for Physicians, Medical Students and Health Workers. In Three Volumes. By Victor C. Vaughan, M.D., LL.D., Emeritus Professor of Hygiene, University of Michigan. Assisted by Henry F. Vaughan, M.S., Dr. P.H., and George T. Palmer, M.S., Dr. P.H., Epidemiologist, Department of Health, City of Detroit. Volume II, Nutritional Disorders and Alimentary Infections. Precutaneous Infections. 53 text figures. 917 pages. St. Louis: C. V. Mosby Co., 1923. Cloth, $9.00.

The author states in his introduction that "we have not done justice to animal parasitic infections because space did not permit." This observation is true, for this section of the subject is not covered in the detail one would expect in a book of this kind. Knowing the author's ability, it is to be regretted that the publishers did not allow adequate space to present this subject. It also appears strange that in the discussion on typhus fever, which takes up the history of this disease in detail, there is no mention of Plotz bacillus or Rickittsia Prowazeki. Also there is no reference to the Weil-Felix reaction under this disease despite the importance now attached to it by the Federal and state health organizations.

The sections on nutritional disorders, the typhoid fevers and food poisonings are models of completeness. The remaining sections are well covered, and the book can be summed as a splendid presentation of the subject.

Rules for Recovery from Pulmonary Tuberculosis. A Layman's Hand Book of Treatment. By Lawrason Brown, M.D. Fourth edition, revised. 217 pages. Philadelphia and New York: Lea & Febiger, 1923.

This admirable little book, written for the sufferer of this dreaded disease by one of the masters in the field of tuberculosis, tells the story of the methods of a cure in non-technical language.

Dr. Brown, a man who probably has seen and treated more tuberculosis than any other living person, has embodied the fruits of his ripe experience. It should prove invaluable to the tuberculous.

The Medical Clinics of North America. Volume 6, San Francisco Number. May, 1923. Index Number. 248 text figures. 253 pages. Philadelphia and London: W. B. Saunders Co. Published bi-monthly. Paper, $12.00 per year.

The current number of the Medical Clinics is up to the high standard which from past experience one expects from this publication. It is a good number, and is even better than usual. It is a well rounded collection of clinical presentations.

Legal Medicine and Toxicology. By Many Specialists. Edited by Frederick Peterson, M.D., LL.D., Manager, Craig Colony for Epileptics; Formerly Professor of Psychiatry, Columbia University; Consulting Alienist, Bellevue Hospital, and Manhattan, Flatbush and Central Islip Hospitals for the Insane, New York City. Walter S. Haines, A.M., M.D., Late Professor of Chemistry, Materia Medica and Toxicology, Rush Medical College; Late Professorial Lecturer on Toxicology, University of Chicago. And Ralph W. Webster, M.D., Ph.D., Assistant Professor of Medical Jurisprudence, Rush Medical College; Director of Chicago Laboratory. Clinical and Analytical. Two volumes, with 242 text figures and 2 colored plates. 1196 pages and 92 text figures. 1072 pages, respectively. Philadelphia and London: W. B. Saunders Co., 1923. Colth, $20.00.

The editors have selected their contributors with care, and each subject is clearly presented. The first volume is given over to general aspects of legal medicine and the second to toxicology and laws affecting the practice of medicine and pharmacy as related to the dispensing of drugs.

The advice given to the physician and lawyer relative to expert testimony is of real value. The section on "Identification of the Living" by Alphonse Bertillon is an example of completeness. Volume II is given to toxicology. A splendid feature is that each volume has a complete index appended as well as a general index to both volumes in Volume II.

The whole subject is covered in such a thorough manner that it would be difficult to find a poorly presented section. The book has been revised and brought up to date in a most satisfactory manner.

A Text-Book of Pharmacology and Therapeutics. By E. Paulsson, Professor of Pharmacology, University of Christiania. English Edition, edited by W. E. Dixon, M.A., M.D., F.R.S., Reader in Pharmacology and Assesser to the Regius Professor of Physic, Cambridge. 519 pages. London: William Heinemann (Medical Books) Ltd., 1923. Cloth, 25/-.

The editor of the English edition directs attention to the Continental teaching of drug action and the method of their employment at the bedside. He has omitted comments or foot notes where the author differs from the views held in England, for he wisely remarks that the reader seeks the opinions of the author himself and not the comments of an outside critic.

The section on Ion-Action and Salt Action under the heading of "Salts of Light Metals, Alkalis, Acids, Halogens, Oxidizers," etc., is an exceptionally clear and comprehensive presentation of this subject.

It differs from similar text-books of America and England in some of its teachings. It should appeal to any physician who cares to inform himself of the Continental methods of therapy.

The author has made himself thoroughly familiar with modern literature and gives due credit regardless of nationality.

Oxford Medical Publications. War Blindness at St. Dunstan's. By Sir Arnold Lawson, K.B.E., M.D., F.R.C.S., L.R.C.P., Senior Ophthalmic Surgeon and Lecturer on Ophthalmic Surgery, Middlesex Hospital; Late Surgeon, Royal London Ophthalmic Hospital, etc. 148 pages. New York: Oxford University Press.

The present volume is an account of the work done at St. Dunstan, the hospital given over to the treatment of the British war blind from 1914 to 1920. It is based upon the observations of 1,344 officers and enlisted men.

The work is presented in the form of case reports, with discussions of each case and the type of eye disorder represented. The author's remarks on syphilis as related to the eye are of especial value.

The book should prove helpful to the ophthalmologist and to those interestde in industrial injuries to the eye.

Applied Psychology for Nurses. Lippincott's Nursing Manuals. An Introduction. By Donald A. Laird, Assistant Professor of Psychology, University of Wyoming; Lecturer in Nursing Psychology, Invinson Memorial Hospital School of Nursing. 47 text figures. 236 pages. Philadelphia and London: J. B. Lippincott Co., 1923. Cloth, $2.50.

The author has written a very complete book from an elementary point of view and has well explained the basic principles of psychology. He wisely stresses the importance of the nurse's knowing herself as well as her patient psychologically.

The book should prove an addition to the text books of nursing and could with advantage be added to the list of any training school.

Southern Medical News

ARKANSAS

Jackson County Medical Society has elected Dr. Walter Stallings, President; Dr. J. H. McCurry, Vice-President; Dr. M. L. Harris, Secretary-Treasurer.

The Masonic order of the State is planning to build a $50,000 fire-proof building at the State Sanatorium for Tuberculous Children. When completed the capacity of the sanatorium will be 300.

The last session of the Arkansas Legislature appropriated $75,000 for additional buildings at the State Tuberculosis Sanatorium, Booneville. The capacity will be 260 beds. There was also an appropriation of $75,000 to establish a tuberculosis sanatorium for negroes.

Deaths

Dr. W. S. Muldrow, Mineral Springs, aged 73, died suddenly May 2 from heart disease.

Dr. Rufus S. Rice, Rogers, aged 60, died March 21 from uremia and chronic nephritis.

Dr. R. B. Gibson, Cherry Valley, aged 67, died at St. Josep'h Hospital, Memphis, Tenn., May 19 from heart disease.

Dr. William D. Alford, Murfreesboro, aged 87, died suddenly May 12 from heart disease.

DISTRICT OF COLUMBIA

At a meeting of the Board of Education, Washington, it was decided that provisions for more extensive medical inspection in the public schools will be sought in next year's budget, if the board can obtain the support of the local social service agencies interested in the work.

Dr. Hugh S. Cumming, Surgeon General of the U. S. Public Health Service, has gone to Geneva, Switzerland, to arrange collaboration of the League of Nations' international health work with the United States.

Deaths

Dr. Michael Joseph Ready, Washington, aged 44, died May 19 following a long illness.

Dr. Randolph Breese Brummett, Washington, aged 53, died at the Emergency Hospital May 7 from heart disease.

Dr. William Holland Heron, Washington, aged 56, died May 12.

FLORIDA

The Florida Railway Surgeons' Association has elected Dr. Henry C. Dozier, Ocala, President; Dr. Julius C. Davis, Quincy, Vice-President; Dr. Edmund W. Warren, Palatka, Secretary.

Deaths

Dr. Howard Switzer, Miami, aged 73, died May 26.

Dr. Theophilus West, Marianna, aged 87, died April 10 from senility.

GEORGIA

Butts County Medical Society has elected Dr. H. W. Copeland, President; Dr. A. F. White, Vice-President; Dr. J. Lee Byron, Secretary-Treasurer.

Dougherty County Medical Society has elected Dr. A. W. Wood, President; Dr. N. E. Benson, Vice-President; Dr. W. S. Cook, Secretary-Treasurer.

Floyd County Medical Society has elected Dr. J. L. Garrard, President; Dr. W. B. Floyd, Vice-President; Dr. M. M. McCord, Secretary-Treasurer.

Gordon County Medical Society has elected Dr. R. M. Gray, President; Dr. W. R. Richards, Vice-President; Dr. Z. V. Johnston, Secretary-Treasurer.

Hart County Medical Society has elected Dr. G. T. Harper, President; Dr. A. O. Meredith, Vice-President; Dr. T. R. Gaines, Secretary-Treasurer.

Jasper County Medical Society has elected Dr. R. F. Cary, President; Dr. L. Y. Pittard, Vice-President; Dr. J. W. Payne, Secretary-Treasurer.

Ocmulgee Medical Society has elected Dr. J. M. Smith, President; Dr. W. A. Coleman, Vice-President; Dr. W. H. Pirkle, Secretary-Treasurer.

Polk County Medical Society has elected Dr. E. H. Richardson, President; Dr. G. M. White, Vice-President; Dr. S. L. Whitely, Secretary-Treasurer.

Screven County Medical Society has elected Dr. A. D. Lewis, President; Dr. Louis Hannah, Secretary; Dr. L. F. Lanier, Treasurer.

Tattnall-Evans County Medical Society has elected Dr. Dan S. Clanton, President; Dr. J. C. Harris, Vice-President; Dr. J. C. Collins, Secretary-Treasurer.

Ware County Medical Society has elected Dr. W. F. Reavis, President; Dr. D. M. Bradley, Vice-President; Dr. J. E. Penland, Secretary-Treasurer.

Dr. Victor H. Bassett, Savannah, has been elected Health Officer of Tybee.

The Good Samaritan Clinic, devoted exclusively to disorders of the ductless glands, was recently opened in Atlanta. It is supported by a group of prominent capitalists who form its board of trustees. Twenty physicians and an orthodontist compose its medical staff.

Drs. Albert L. Crittenden, Shellman, and Frederick D. Petterson, Culbert, have been appointed members of the State Board of Health.

Deaths

Dr. James Wallace Van Dusen, Fort Benning, aged 52, died at the Walter Reed General Hospital, Washington, D. C., May 2 from ileus paralyticus.

Dr. Silas W. Arrowood, Atlanta, aged 64, died April 22 at a local sanatorium.

Dr. Robert Warren Colquite Green, College Park, aged 72, died March 20 from chronic nephitis.

KENTUCKY

The Northeastern Kentucky Medical Association has elected Dr. Z. T. Thompson, Pikeville, President; Drs. M. B. Wicker, Meeksburg, G. B. O. O'Roarke, Grayson, G. E. Johnson, Jenkins, Vice-Presidents; Dr. C. E. Downs, Ashland, Secretary; Dr. H. G. Morris, Greenup, Treasurer.

Muhlenberg County Medical Association has elected Dr. E. L. Gates, President; Dr. H. Tyldsley, Vice-President; Dr. W. McNeil, Secretary.

Bullitt County Medical Society has elected Dr. G. W. Kirk, President; Dr. R. J. Kerr, Vice-President; Dr. R. L. Hackworth, Secretary-Treasurer.

Nicholas County Medical Society has elected Dr. W. H. Martin, President; Dr. L. K. Swango, Vice-President; Dr. C. W. Kash, Secretary.

The University of Louisville has acquired a new $270,000 campus of about 40 acres, to which the College of Arts and Sciences will be moved within two years and on which new buildings will be erected. An agreement has been made between the city and school authorities by which the professional administration of the Louisville City Hospital is given over entirely to the University.

Owners of the Brosheer-Brummett Hospital, Middlesborough, are planning to build two two-story buildings adjoining the hospital.

A memorial to Dr. Sidney J. Meyers, who died recently, may be raised by voluntary subscription. E. S. Tachau has been named chairman of the committee sponsoring the memorial. The form of the memorial will be decided upon later.

Deaths

Dr. Sidney Johnston Meyers, Louisville, aged 50, died May 28 at St. Joseph's Infirmary, following an operation.

Dr. William Henry Coleman, Louisville, aged 53, died May 17 from cerebral hemorrhage.

LOUISIANA

Dr. George E. Beyer, entomologist of the State Board of Health, New Orleans, has been granted a leave of absence to go to San Domingo to assist in stamping out malaria.

Dr. John F. McHugh, Mansfield, has resigned as Health Officer of DeSoto Parish.

Deaths

Dr. James Duffield Toy, De Ridder, aged 46, died May 2.

MARYLAND

Dr. Howard A. Kelly recently presented a Della Robbia Bambino to the Babies' and Children's Clinic at the University of Maryland.

(Continued on page 36)

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

ON CURRENT CONCEPTIONS OF THE ETIOLOGY AND PATHOGENESIS OF TETANY*

By Lewellys F. Barker, M.D.,
Baltimore, Md.

More than a century has passed since the tonic spasms of tetany, involving the glottis or the extremities, were first observed and described by British clinicians (Clarke, 1815; Kellie, 1816) and during this period knowledge concerning the symptomatology of the disease and its pathogenesis has made truly remarkable progress. The spontaneous attacks of the peculiar tonic spasms that are characteristic of manifest tetany vary in intensity, in duration and in painfulness. They affect the muscles of the larynx and cause laryngospasm, and they occur in certain groups of muscles in the upper and lower extremities, giving rise to the well known tetany attitudes (obstetrical hand with flexed forearm in the upper extremity; extreme supination of the foot with extension of the knee in the lower extremity; or so-called carpopedal spasms when both upper and lower extremities are simultaneously attacked).

Though the name "tetany" was given by Corvisart (1852) to these contractures of the extremities in the adult, gradually, as knowledge extended, the term has come to be applied not only to the spontaneous attacks of muscular contraction known as "manifest tetany" but also to the condition known as "latent tetany" in which there is susceptibility to similar spasm on mechanical stimulation of certain peripheral nerves (Trousseau's phenomenon; Chvostek's phenomenon; Pool's phenomenon), as well as to the underlying "tetany diathesis" of which the only marks may be (1) an increased and altered electrical excitability of the motor nerves (Erb's phenomenon); or (2) an increased mechanical excitability of the facial nerve (Chvostek's sign); or (3) certain peculiar trophic disturbances (defects in the enamel of the teeth, and peculiar turbidities of the crystalline lens).

Clinical students of tetany early recognized many of the essential facts regarding the disease. Thus they soon discovered that it may occur at any age (in sucklings, as well as in older children and in adults). They recognized that the disease may occur in epidemic form and that in certain cities it appears to be endemic, though sporadic cases may occur anywhere. They learned, too, that the syndrome may be acute or chronic, and that it is especially in the chronic cases that vasomotor phenomena, secretory phenomena, and trophic changes (such as enamel defects in the teeth and early cataract in the eyes) occur. They found that the disease is met with in both sexes, and that it may be associated with certain diseases of the stomach or intestine (gastric tetany; colonic tetany), or with pregnancy or lac-

*Read in the Section on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

tation. Again, it was shown that it may develop in the course of certain infections or intoxications, though it sometimes appears in persons who are otherwise apparently healthy (idiopathic tetany).

Of extraordinary importance was the observation by Weiss, toward the end of the past century, of the appearance of tetany in certain patients after operation for the removal of goitre. This tetania strumipriva was for a long time thought to be dependent upon removal of the thyroid gland. It was only after ten or fifteen years had passed that it became established that this form of tetany was not a tetania thyreopriva but a tetania parathyreopriva (Gley, 1890; Vassale, 1906).

Numerous experimental studies began to be undertaken and it soon became clear that the parathyroid glands stand in a peculiar relation to tetany. Thus it was found that when the thyroid gland and the parathyroid glands are simultaneously extirpated from animals, they react with tetany, whereas when the thyroid gland alone is removed, tetany does not occur. These researches corroborated the observations of surgeons in various parts of the world who had noticed that if in man the parathyroid glands are removed during thyroidectomy tetany may appear and that if they are not removed with the thyroid, or are not injured at the operation, tetany does not appear. Complete parathyroidectomy in man, or in animals, is nearly always followed by tetany. Animals in which partial parathyroidectomy has been done may remain free from symptoms, though they are in a condition of latent tetany, and may exhibit manifest tetany during pregnancy. After this knowledge had been gained the technic of strumectomy became rationally so modified that injury to, or removal of, the parathyroid glands with ensuing tetany became a rare occurrence. It was interesting that surgeons in Austria had found empirically that tetany occurred less often when the thyroid gland was resected at operations for goitre than when one or both lateral lobes had been extirpated. The reasons for this interesting clinical fact could be recognized only after knowledge of the relation of the parathyroid glands to tetany had developed.

Once it had been demonstrated that tetany after strumectomy depends upon removal of, or injury to, the parathyroid glands, that in other words, the tetania strumipriva of human beings depends upon the existence in the patient of a status parathyreoprivus (W. S. Halsted), the conception easily arose that all the other forms of tetany as well as that occurring after strumectomy might depend upon hypoparathyroidism. Since the clinical phenomena in tetany occurring in infections, in pregnancy, in lactation, in pyloric obstruction, etc., were practically identical with the symptoms in tetania parathyreopriva, it seemed rational to assume that this identity could best be accounted for by assuming a common pathological-physiological basis and Pineles, especially, urged the medical world to accept hypoparathyroidism as a unitary conception for the pathogenesis of tetany. Though workers on tetany now believe that hypoparathyroidism, no matter what its cause (operative injury or removal; infections or intoxications with toxic degenerative change or hemorrhages into the glands; local inflammation of the glands; as in the interesting case of tetany in which Winternitz demonstrated the presence of miliary tubercles in the parathyroid glands; or neoplasms in the parathyroid glands) may be followed by tetany, still the more cautious workers on tetany are inclined to keep their minds open to the possibility that the syndrome may also occur independently of disturbance of the parathyroid function. That this cautious attitude is reasonable will become obvious on attempts to analyze the possible relations of parathyroid deficiency to the altered functions of the nervous system in tetany.

That the nervous system is profoundly influenced in the tetany diathesis, in latent tetany and in manifest tetany, is obvious from a consideration of the neural phenomena that characterize these conditions. It is not alone the peripheral nervous apparatus that is disordered; on the contrary, even more important changes must exist within the central nervous or-

gans. The over-excitability of the motor apparatus is evidenced not only by the spontaneous attacks of tonic spasm and sometimes of epilepsy, but also by the reactions to electrical and mechanical stimuli that are characteristic of latent tetany and of the tetany diathesis. The over-excitability of the sensory apparatus is revealed by the characteristic paraesthesias of which patients complain as well as by Hoffman's sign. And, finally, the autonomic nervous system in its vasomotor, its secretory and its trophic components is also involved, even more markedly than was formerly supposed. Though the trophic changes in the crystalline lens and in the enamel of teeth were recognized comparatively early, it is only recently that the over-excitability in other vegetative domains has been fully valued in adults (Falta) and in children (Ibrahim). The vegetative nerves are found to react abnormally in tetany both to sympathicotonic and to vagotonic stimuli (adrenalin; pilocarpin). Symptoms like gastrospasm, spasm of the urinary bladder with urinary retention, cramp-like narrowing of the bronchioles and even cramp of the heart muscle may, it seems, depend upon altered reactivity in autonomic domains, due to a tetany that sometimes goes unrecognized.

Though the neural involvement in tetany is therefore widespread, still there is evidence that it is not a uniformly diffuse involvement, but is definitely elective. Thus, the distribution of the phenomenon of increased muscle tonus in tetany points to a predominant involvement of that important neural mechanism that is situated in the midbrain and hindbrain in the area extending between the red nucleus above and Deiter's nucleus below, namely the aggregate of nerve cells known collectively as the "nucleus motorius tegmenti of Edinger." Again, the sensory and the autonomic phenomena bespeak an elective discrimination among the neural elements in tetany rather than a general disturbance affecting all the neurons equally.

If then, as seems necessary, an elective involvement of the motor, sensory and autonomic apparatus must be assumed, how can such a selective alteration in the nervous functions be thought of as originating? Some have assumed as an explanation the existence in tetany of some poison that has a selective affinity for certain parts of the neural apparatus. And since tetany is known to occur in parathyroid deficiency, it has been further assumed that an important function of the parathyroid glands must consist either in the prevention of the development of a hypothetical tetany poison, or in the neutralization or detoxication of this poison after it has been formed. This view that tetany depends upon some form of autointoxication soon led to a search for the toxic substance, as well as to careful studies of the metabolic processes in tetany.

It would scarcely be profitable in a symposium of this sort to refer in any detail to the long series of studies that have been made in the directions just mentioned. It will suffice to state that at the present time three main theories of the disturbance of metabolism in tetany are under consideration. The first theory assumes a disturbance of the equilibrium between antagonistic cations in the blood and tissue fluids, especially in the relation between calcium and magnesium cations on the one hand and potassium and sodium cations on the other. The second theory assumes a disturbance of the acid-base equilibrium, either in the direction of an acidosis or of an alkalosis. And the third theory assumes an intoxication due to certain physiologically active amino-bases, such as methyl-guanidin and dimethyl-guanidin.

Following upon the fundamental biological researches of Sabbatanni in Europe and of Jacques Loeb in this country upon the antagonistic action of cations like calcium and magnesium on the one hand and those of sodium and potassium on the other, various clinical observers studied the calcium metabolism in tetany. Among the experimental researches on the subject those of MacCallum and Voegtlin (and their collaborators) are of especial importance. These investigators found that dogs in which tetany had been induced by extirpation of the parathyroids could be restored to an apparently normal condition quite promptly by the injection

of a solution of salt of calcium into the circulation. It was natural to conclude from this experiment that tetany is an expression of the hyperexcitability of the nerve cells due to withdrawal of calcium. Clinical experience teaches also that calcium lactate administered by the mouth, or calcium chlorid injected intravenously, will often control the paroxysms of tetany, whereas injections of sodium and potassium salts intensify the symptoms, or may bring on an attack of tetany in apparently healthy persons.

Disturbances of the acid-base equilibrium (changes in the hydrogen-ion concentration in the blood) have frequently been observed in tetany. The finding of ammonia in increased quantities in the urine in tetany cases led to the conception that acidosis may be a cause of tetany, but later studies, especially those of the tetany produced by forced respiration in health (Collip and Backus; Grant and Goldman) indicate that before the development of the tetany there is an alkalosis, though after the tetanic contractions set in this may give way to a subsequent acidosis. Apparently the total amount of the calcium in the blood need not be diminished during the alkalosis or the acidosis of tetany. It has been suggested that the tetany in these cases depends upon a diminution of the ionized calcium in the blood and in the tissue fluids. In tetany, due to extirpation of the parathyroids, MacCallum found a definite diminution of the total calcium of the blood and an increased excretion of calcium from the body. Hastings and Murray also have found a reduction of normal calcium values in dogs suffering from experimental tetany. These observations are in accord with the observations of Howland and his collaborators in infantile tetany.

The third interesting hypothesis concerning the pathogenesis of tetany is that which has developed since the finding, by W. Koch in this country in 1912 and 1913, of methyl-guanidin in the urine of dogs suffering from tetany after parathyroidectomy. Later, in England, Paton and his collaborators experimented on different animals, producing, by the injection of guanidin hydrochlorid and methyl-guanidin nitrate, symptoms that, they assert, are indistinguishable from those of tetany following parathyroidectomy. They found also that both guanidin and methyl-guanidin are antagonized by calcium salts. Quantitative studies of the guanidin and methyl-guanidin in the blood and urine of animals before and after parathyroidectomy and in the urine of healthy children as contrasted with those suffering from tetany have been made by Burns and Sharpe, who assert that there is a marked increase of these substances in the blood and urine both of parathyroidectomized dogs and of children suffering from idiopathic tetany. Koch has suggested that calcium relieves tetany because it decreases the permeability of the body cells, after which they are unable to take up guanidin.

Influenced by these American and British investigations the experimental study of tetany has been renewed by E. Frank of Breslau (1922). This observer used dimethyl-guanidin, which is eight times as poisonous as guanidin, as a tetany-producing poison. The substance is derived directly from creatin by splitting off CO_2. Frank reports that all degrees of tetany can be produced in experimental animals by injecting this substance. With small doses, galvanic over-excitability alone is produced. With a somewhat larger dose, dyspnea occurs and, later, general rigidity of the body with epileptiform seizures. After the convulsive attack dies down, a distinct rigidity of one or of both anterior extremities remains. Typical tetany attitudes such as are often seen in the tetany of sucklings (flexion of anterior extremities, extension of posterior extremities) develop in the experimental animals. Intravenous injection of a 10 per cent solution of calcium chlorid will control the tetany of guanidin poisoning as it does other forms of tetany. Frank suggests that if dimethyl-guanidin is the tetany poison it probably acts by becoming fixed to the living nerve cell, loosening in some way or other the combination of calcium so that the latter can be driven out of the colloids. He assumes that in parathyroid insufficiency enough dimethyl-guanidin may become active to injure the special

parts of the nervous system that are most concerned in tetany. It is, as he suggests, conceivable that a latent tetany due to mild hypoparathyroidism might become manifest from any cause that increased this endocrine deficiency; from any cause that leads to removal of acids from the body (e.g. vomiting in pyloric stenosis); from any cause that diminishes the calcium content of the body (e.g. chronic diarrhea); or from any cause that leads to an increase of sodium cations (e.g. intravenous injection of sodium bicarbonate) or of potassium cations and phosphoric acid anions (e.g. feeding of cow's milk to sucklings).

From this brief review of contemporary studies of the metabolism in tetany it will be clear that students of the disease are endeavoring through their researches to forge the links in the pathogenetic chain that connects parathyroid deficiency with hyperexcitability of the nervous system. Intoxication by guanidino-bases, disturbance of acid-base equilibrium, or disturbances of the relative proportions of antagonistic cations in the blood and tissue fluids, may prove to be among the links. Once the links that constitute the pathogenetic chain in the development of tetania parathyreopriva have been determined, students will endeavor to ascertain whether the other forms of tetany can be demonstrated to possess similar links in their pathogenetic chains. Certain of these forms may conceivably be entirely independent of any primary disorder of the parathyroid glands or of any disturbance of parathyroid functions, for pathological processes may easily be thought of as becoming interpolated at the level of any one of the series of links in the parathyroid-nervous system chain, sometimes perhaps closer to the parathyroids, sometimes closer to the nervous system, sometimes in a more intermediate position between parathyroid function and neural disturbance. For example, in the tetany of hyperpnea coming on, say, after a few minutes of forced respiration in health (see above) or of spontaneous hyperpnea in disease (Barker and Sprunt; Goldman) it is scarcely conceivable that the parathyroid function can be concerned at all. It would seem much more likely that the change here sets in at an alkalosis link, whereas in the tetany of chronic diarrheas accompanied by increased calcium excretion in the feces, it may set in at a cation antagonism link.

For a long time the clinic made progress by attempting to corroborate Pineles' conception of a unitary pathogenesis of tetany. For the time being it may do well to attempt to refute the unitary conception by establishing the existence of different pathogenetic chains or by determining the possibility of intervention of special processes at the level of the different links in a single chain. The subject is a fascinating one and stimulating to the imagination. There is but little profit, however, to be derived from over-indulgence in speculation. Real progress must come from the painstaking experimental investigations that are undertaken to corroborate or to refute our hypothetical conjectures.

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Discussion follows paper of Dr. Roberts, page 578.

THE DIAGNOSIS AND TREATMENT OF TETANY*

By Stewart R. Roberts, M.D.,
Atlanta, Ga.

The relative rarity of tetany in the South makes necessary a ready diagnostic knowledge that will permit its easy recognition. Holt saw on an average only a dozen cases a year in his hospital service in New York. It is a clinical syndrome that often develops surreptitiously when least expected, and the symptoms may be full blown before its presence is even suspected. It may occur at any age. Trousseau mentions a case at 52 and one at 60, and yet it is a disease of infancy. Sporadic cases may occur anywhere, yet in some places it is endemic and even epidemics occur in Vienna. It may be defined as an entity characterized by a hyperexcitability of the neuro-muscular apparatus tending to spasms of certain muscular groups, an upset in the calcium metabolism and the electric reaction of the nerves, with an apparent relationship to the parathyroid glands. It may develop of itself without relation to other disease, or it may complicate a pregnancy, a surgical operation, a lactation period or a case of rickets or a diarrhea.

With these outstanding facts in mind, the diagnosis resolves itself into the symptoms of the paroxysms and the symptoms of latent tetany or the intervals between the muscular spasms.

The paroxysm is peculiar to tetany. Pain, numbness and tingling in the extremities may precede the bilateral spasms. The domain of the muscular groups involved is usually limited to the extremities, the upper being usually first involved. Unilateral spasms occur, but a bilateral involvement is the rule. In infants irritability, restlessness and increasing crying may usher in the spasms. The carpopedal spasm is found only in tetany and is therefore of itself diagnostic of the disease. This is the so-called obstetrical hand. The hand is flexed at the wrist, the fingers deflected to the ulnar side, and extended but flexed at the metacarpo-phalangeal joints, the thumb adducted and lying snug in the palm in close approximation to the palmer surface of the fingers. The feet are extended sometimes even to the extent of an equinovarus, the toes are flexed, the palmer surface arched and the dorsum of the foot humped camel-like. These spasms may persist or relax and recur periodically. The elbow, shoulder, knee and wrist joints are usually free, but contractions of their muscles may cause them to be relatively immovable for a time. The adductors of the thigh, the muscles of the face, trunk, larynx and eye may be involved. The crowing sound of the infant is often of diagnostic value. This, of course, results from the laryngismus stridulus. Convulsions occur in infants, but are not different in nature from those arising from any other condition. They may occur in series with the child apparently normal in the intervals. An examination, jarring the bed or undue disturbance may set off a convulsion. Pain may occur during the spasm of any group or in an effort to overcome the spasm. There may be neither fever nor unconsciousness. The fingers, toes and muscles may keep the position in which they are placed as the muscles

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remain contracted, a katatonia of tetany. In children with tetany any acute disease is usually ushered in with convulsions.

The diagnosis is of course more difficult in the intervals between the spasms or the general convulsions. In the cases that Trousseau classified as the mild forms, contractions may not occur, or may occur so rarely and pass so rapidly that they may not be seen. And yet the diagnosis may be made just as accurately. There are four rather well known signs or tests that either aid or confirm a suspected tetany. They are to be weighed with other evidence of the disease and not considered by themselves alone in reaching a diagnostic conclusion. They are:

(1) Trousseau's sign. Pressure on the nerves in the bicipital sulcus either by the fingers, a tourniquet or far better the ordinary cloth-covered rubber cuff of the blood pressure apparatus may cause the carpal spasm. It is more difficult to cause the pedal spasm. As Barker has pointed out, it is well to keep up this pressure for as long as five minutes on the arm if the positive sign is suspected and does not appear earlier. The cuff should be tight enough to constrict the pulse, though the production of the spasm is through the nerves and not through the vessels. This sign is not positive in all cases of tetany, though on the other hand it is not found in any other disease.

(2) Chvostek's sign is a quick, localized spasmodic contraction of the muscles of the face elicited by tapping lightly with the finger or a percussion hammer the facial nerve and more particularly after it emerges from the parotid gland. One can tap just in front of the external ear below the zygomatic process. Howland thinks that this sign is pathognomonic of tetany in children under two years of age and rightly says it may occur in older children and adults who do not have tetany. I have found it positive in negroes with advanced pulmonary tuberculosis with emaciation, in typhoid fever and sepsis.

(3) Erb's sign, or the electrical excitability of the motor nerves to the galvanic current, is the most positive sign of the disease. An accurate instrument is necessary, for in health a galvanic current applied to a motor nerve does not cause muscular contraction with a current of less than five milliamperes. In tetany the contraction takes place with this strength and often with far less strength of current. There is both cathodal and anodal hyperexcitability. This sign is often likewise absent and is further subject to the limitations of an electric battery and need of experience in its use. The electrode may be applied over the median nerve at the bend of the elbow when on stimulation the hand is flexed at the wrist. A more common site is the peroneal nerve on the outside of the leg just below the head of the fibula. Stimulation here affects the three peroneal muscles and everts the foot after the manner of a pes valgus.

(4) Hoffman's sign is an increased excitability of the sensory nerves in tetany. This test is not so important for diagnosis as the Erb's phenomenon.

In infants and children one is often struck by the frequency of the convulsions and by how well the child appears mentally and physically between them. Tetany seems to be associated with rickets. Indeed, rickets probably predisposes the child to tetany, and convulsions occurring in a child with the former disease should certainly raise the question of the latter. There is apparently a tetany face in children due to a slight increase in degree of the muscular tonus of the facial muscles. It carries with it an expression of care or anxiety or previous suffering. Trophic and secretory disturbances occur. These involve lachrymation, pallor, dermography, edema of the face or feet, shedding of the nails and hair, pathological changes in dentition and particularly the parallel rows of enamel defects on the adult teeth. The so-called gastric tetany occurs in association with dilatation of the stomach and is more frequent in adults. It is usually due to pyloric stenosis, though it may occur in association with duodenal obstruction and colonic dilatation.

The differential diagnosis is usually not difficult. Tetanus may be distinguished by the contraction beginning in the face and not in the extremities, and by the

usual history of the wound. In epilepsy the convulsions are rarely so frequent. Meningitis can be distinguished by its characteristic signs and a lumbar puncture would be conclusive. The age, sex, history and stigmata would separate hysteria. Peculiar forms of encephalitis could be distinguished by the absence of the Trousseau, Chvostek or Erb's phenomena.

TREATMENT

If the general therapeutic indications in the treatment of tetany are once understood, the details fashion themselves very easily.

(1) To stop the convulsions and spasms, relieve the laryngospasm and lessen the irritability of the nervous system:

(a) Morphia is given hypodermically in doses from one-sixtieth to one-fourth grain, and chloral hydrate from two to twenty grains by mouth or rectum. When the convulsions are extreme, chloroform inhalations may be necessary. Repeated hot baths are extremely soothing. In one case I felt that two lumbar punctures aided in relieving the severe and repeated convulsions.

(b) The laryngospasm requires active treatment. Warm baths, castor oil, high warm enemas, chloral and hot stupes to the neck are advisable. When the child is in apnea, cyanotic, and dissolution threatened, dashing cold water on the face and body or quickly elevating the feet and lowering the head may help. Intubation apparently is useless.

(c) Since Marriott and Howland have shown the fall in the calcium content in the blood serum in tetany, a chemical reason on a more permanent basis is proven for the therapeutic use of calcium to relieve the convulsions and spasms. Calcium chloride is the drug of choice given in doses of five to fifteen grains four to six times daily. It requires from one to two days before it influences the disease, and should be continued for a long time, three to six weeks, inasmuch as it is eliminated very rapidly. In emergency, it may be given intravenously in normal salt solution in ten to twenty-five per cent strength.

(2) During the acute attack, cow's milk should be withdrawn or greatly diminished and cereals and gruels substituted. In older children and adults the fresh vitamin-containing vegetables are in order. A well balanced diet is indicated when possible.

(3) Hygienic measures are particularly important. In one case I was impressed with the improvement when the child was given abundant fresh air and sunshine.

(4) When tetany is associated with another disease which bears to it a casual relation, treatment of the primary disease is essential.

(a) Tetany associated with rickets emphasizes the treatment of rickets and the administration of cod liver oil and small doses of phosphorus. These can be given in one prescription. In children ten drops of the oil per dose is often sufficient.

(b) Tetany associated with pregnancy usually continues until the pregnancy is interrupted or terminated naturally. Lactation tetany demands the cessation of nursing if large and continuous doses of calcium are unavailing.

(c) Gastric tetany associated with pathology of the stomach, duodenum or colon usually demands surgical and mechanical aid. The mortality here is high on account of age and the danger of operation. The prognosis is grave if the stenosis is cancerous in origin, hopeful if benign.

(d) Tetany associated with and following operation upon the thyroid gland intimate the necessity for the use of the parathyroid hormone in the form of the tablet. The organotherapy seems useless in tetany from other causes. Parathyroid transplants and grafts may be considered in such rare cases.

DISCUSSION—SYMPOSIUM ON TETANY

Papers of Drs. Lewellys F. Barker and Stewart R. Roberts.

Dr. E. Bates Block, Atlanta, Ga.—Oppenheim called attention to the fact that the disease is particularly common among tailors, and that possibly it was an occupation neurosis. The etiology is undetermined except that we know some cases develop from parathyreopriva. However, other cases develop from other causes.

In reference to Erb's phenomenon, the test is usually made after the diagnosis and merely to confirm the diagnosis, and it is of some value in this way, that you may have only a description of the attack and not actually see the patient in an attack. If you see the patient in an attack it is a typical thing. In such cases, where you get a cathodal closing contraction of the ulnar nerve with one milliampere or less, you may believe it is tetany. If you get cathodal closing tetanus with less than five milliamperes, it is definite evidence that the case is tetany.

Trousseau was of the opinion that it was pressure upon the blood vessels and nerves that produced the phenomenon that he named. The blood vessels have been excluded by the method of using a blood pressure apparatus and the pressure did not eliminate either the diastolic or systolic pressure, so that both were still present. You can by prolonged pressure produce tetanic contractions without doing away with the diastolic or systolic pressure, which is pressure upon the nerves and not pressure upon the blood vessels, as Trousseau at first thought. It was thought at one time that the reaction in gastric tetany was purely a reflex phenomenon. Cutting the splanchnic nerve and cutting the vagus nerve did not do away with tetany in these cases, which has a tendency to prove that it is not a purely reflex phenomenon, but throws a little more weight on the chemical side.

To take up the chemical side of it, the calcium theory has been perhaps the one that we have heard most about. Injections of calcium in a vein do away with the tetany for six or seven hours, but no longer. You get a prolonged effect, however, if you put these patients on cod liver oil and phosphorus.

I had one case of very profuse diarrhea in a pellagrin, and at Dr. Paullin's suggestion I gave her three intravenous injections of calcium chlorid. Several hours after each injection there was a violent convulsion with loss of consciousness. Fortunately her diarrhea ceased from this treatment, but she had severe convulsions, which seems to show that calcium does not have so good an effect in controlling convulsions as we thought.

A very important point in tetany is that the somatic nerves, or motor nerves, cause the contraction of muscles. I did some work upon this subject some time ago. It is probable that we have the same dual innervation of the somatic muscles that we have of the pupil of the eye: namely, a motor contracting nerve, and a sympathetic relaxing nerve.

Dr. W. McKim Marriott, St. Louis, Mo.—The several theories regarding the nature of tetany, at least in the case of infantile tetany, are not necessarily contradictory. They can all be brought into rather simple relationship.

Mention has been made of the fact that in tetany, especially in infantile tetany, the calcium of the blood is lowered. From experimental evidence it appears that the blood calcium is invariably lowered in infantile tetany, but every infant that has a low blood calcium does not necessarily show active manifestations of tetany. The tetany may be latent. There may be no convulsions, no laryngeal or corpopedal spasm, but the electrical reactions may be those characteristic of tetany, and such infants are very likely to react with active manifestations in the presence of superimposed infection, such as otitis media or some other extraneous factor. The so-called "reflex spasms" are very frequently the result of a latent tetany becoming manifest.

In general, it may be stated that the lowering of blood calcium is a pathognomonic sign of infantile tetany. If an infant with convulsions has a normal blood calcium then the condition is not tetany.

Tetany has been attributed, according to one theory, to an excessive production of methyl-guanidin, and this substance when injected is known to lead to symptoms of tetany. It has also been observed, however, that the injection of methyl-guanidin into the blood leads to a change in the inorganic ions. The phosphate ion is increased and the calcium ion diminished. The essential factor of low blood calcium is thus brought about.

The administration of alkalies, especially to patients suffering from nephritis and having a high blood phosphate content, may lead to the symptoms of tetany. In such cases there is an increase in the sodium of the blood and consequently a relative decrease in the proportion of calcium present. During forced respiration a condition of temporary alkalosis occurs and the end result is the same as the result brought about by the injection of alkali.

As the lowered blood calcium content is the essential factor in bringing about the condition of tetany, the treatment is to restore the blood calcium to normal. The administration of calcium chlorid by mouth accomplishes this more quickly than the administration of calcium lactate. This has been proved experimentally. Large doses of calcium chlorid are needed, sometimes as much as 15 grains six times a day to an infant. Even then the blood calcium is not immediately restored to normal. It is several days before this can be accomplished. A cessation of the symptoms of tetany may be brought about more quickly by the subcutaneous administration of magnesium sulphate. Magnesium salts act in a very similar manner to calcium salts in relieving the symptoms of tetany. A dose of magnesium sulphate is 0.2 gm. per kg. of body weight, or 1½ grains per pound, given subcutaneously in 10 per cent solution. Magnesium sulphate has an almost immediate effect and one which lasts until the effect of the calcium administered by mouth becomes manifest. In the case of an infant with tetany it is advisable to continue the administration of moderate amounts of calcium chlorid during the winter months. As tetany is relatively rare in summer, the calcium chlorid may be discontinued about the first of May each year.

Dr. William Engelbach, St. Louis, Mo.—I want to speak of three or four points briefly: first, the pathogenesis; second, the clinical application of

tetany; third, simple diagnosis; and fourth, easy treatment.

Dr. Barker's paper gives us a broader view of the pathogenesis of tetany than that which is ordinarily accepted. We have been inclined to put too much stress upon parathyroid insufficiency as a primary and only cause for tetany.

The incidence of tetany is, I believe, underrated. We have taken it for granted that it is a rather rare and unusual entity; that we do not see it in the South or middle West, or we have few cases in certain locations in which we practice. I believe if we were better informed on the interpretation of the aberrant forms of tetany we would find that it is of rather common occurrence. This syndrome, as has already been said, may be connected with various blood states and other pathologic lesions difficult to diagnose.

I have seen two or three classic cases of transient tetany occur in surgical practice from ligation of the inferior thyroid arteries, producing temporary lack of blood supply to the parathyroids. These cases of transient tetany have been reported in the literature as having been cured by the use of thyroid substances. The probabilities are that in these cases restoration of the collateral circulation to the parathyroids cured the patients.

The work of Dragstedt, of the University of Chicago, in the Physiology Department, has proven that parathyroidectomized animals frequently recover.

The importance of tetany in surgery is probably going to lead to a better understanding of the causes of death in intestinal obstruction. The most classic tetany we have occurs as gastric tetany produced by an obstruction of the pylorus. This type of tetany is easily cured by relieving the obstruction, again proving that parathyroid function is only a part of the etiology of the syndrome.

The work that has been done now on the absorption of certain creatinin and amin substances from the gastro-intestinal tract helps to prove that they participate in the production of this syndrome. It seems from the work that has been done on chemistry and bacteriological studies of intestinal obstruction, it is leading in a general direction toward basic principles of this complex. As Carlson has pointed out, we have in tetany not only a convulsive type, but also a depressive type. He has described tetany in animals in which there were no convulsions.

The diagnosis of tetany is made simply and easily by the Trousseau phenomenon. This sign will, in the majority of cases, enable one to make a diagnosis of tetany in an adult, but not in a child. In an adult that sign is almost specific and can be easily elicited, and in every case in which the Chvostek sign is present it should be tried. The blood chemistry in children, especially deficiency of calcium in the blood, is very important. That applies particularly to all convulsive conditions. A child that has convulsions, with or without temperature, ought to be examined particularly for blood chemistry and other signs of tetany.

Dr. W. A. Mulherin, Augusta, Ga.—Tetany is chiefly a pediatric subject. However, two-thirds of those who attend the meetings of this Section are general practitioners, and one-quarter to one-third of the general practitioner's practice is pediatric.

Fully 90 per cent of all general convulsions occurring under two years of age are due to tetany. Latent tetany frequently exists in infancy and early childhood, without any special manifestation of its existence. Any acute disease may stir up this latent tetany into an active tetany, which usually manifests itself as general convulsions. This is a frequent occurrence, and the physician has not only an acute disease to contend with, but the nasty complication of general convulsions superimposed. If these convulsions are recognized as tetany manifestations, they are easily and promptly controlled, and life is saved. If, on the contrary, they go unrecognized, life is frequently, and unnecessarily, lost.

While the etiology and pathogenesis of tetany is still a most fascinating subject and has not been definitely settled, there is one thing that stands out boldly in the subject, successful and effective treatment. If tetany be due either to absent hormones, or inefficiency of parathyroids, or to disturbance of equilibrium between the cations of magnesium and calcium salts, on the one hand, and sodium and potassium salts on the other hand, or to guanidin intoxication, the resulting convulsions, general or localized, can be promptly controlled by calcium and magnesium salts properly administered.

Our treatment at the Children's Hospital, in Augusta, is quite uniformly successful. For severe and continuous general convulsions, chloroform inhalations, followed by hypodermic injections of magnesium sulphate, grs. 10 to 15, every four hours, and calcium chlorid, grs. 10, every four hours, by mouth, are given; for subsequent treatment, cod liver oil, 1 to 2 drams three times a day after meals, during the winter months.

Dr. Douglas VanderHoof, Richmond, Va.—As clinicians we have been quite familiar with the relationship of calcium deficiency, parathyroid disturbance and excessive meat consumption to the causation of tetany. More recently, however, have been emphasized certain disturbances of the acid-base equilibrium.

In the *Archives of Internal Medicine* very recently there appeared a most interesting clinical communication from the Peter Bent Brigham Hospital, in Boston, in which this particular phase of tetany is emphasized. If I remember correctly, the author (Dr. Grant) details six cases of tetany in adults, all of whom apparently were suffering from a disturbance of the acid-base equilibrium resulting in a relative alkalosis. Three of the cases were associated with pyloric stenosis in which the author felt there was some interference with the passage of hydrochloric acid from the stomach into the intestine. Two cases were patients who had been given large doses of sodium bicarbonate therapeutically. The sixth case was an interesting in-

stance of hysteria in a pupil nurse who had failed in her examinations and developed hyperpnea, and the explanation is that the excessive breathing caused a loss of CO_2 from the lungs, blood, and so forth.

Clinically, in my experience tetany in adults has been associated more often with a true achylia gastrica than with any other one condition. It is not common, but this association of tetany with achylia gastrica is very interesting. Incidentally, the tetany is controlled by the therapeutic administration of full doses of hydrochloric acid.

Tetany in adults is not an infrequent thing. In certain instances it seems to be associated with a chronic focus of infection. One of the worst cases I ever saw was in the wife of a druggist who had frightful attacks, beginning with numbness about the mouth, and contractions of the hand and arm. In a few moments she would fall to the floor and one could lift her up by the head and stand her on her feet absolutely rigid. In her case inhalations of chloroform were used frequently in the attacks, and the tetany absolutely disappeared following an operation on a grossly infected gall bladder. Ten or twelve years have elapsed since this operation and she has not had a recurrence of the attacks.

An interesting fact not emphasized in this discussion is the tetany that occurs following the passage of a stomach tube, especially the old-fashioned large stomach tube, and occasionally after giving an enema. Some of our post-operative cases in the hospital, cases of simple appendectomy, etc., have developed rather striking attacks of tetany, usually terrifying the patient, following the injection of an ordinary soapsuds enema.

Dr. Barker (closing).—The disease is much more common in certain places than in others, hence the term endemic tetany. Manifest tetany in my experience is not a very common disease in adults. It is common enough in infants, and latent tetany is more frequent than is generally believed. If tests for latent tetany are made, signs of it will frequently be found where they were not expected.

Dr. Block referred to tailors as being especially susceptible to tetany. That is true. The cramped position in which they sit has been supposed to interfere with the blood supply to the parathyroids! He spoke also of the Erb sign. I think it is an exceedingly valuable diagnostic sign in children if you suspect the existence of tetany.

I was glad to hear Dr. Marriott emphasize the possibility that these various theories that seem to be mutually exclusive may be all brought together into a single theory. That is what I tried to bring out in my paper when I spoke of a pathogenetic chain and of the several links in the chain.

The giving of magnesium for its immediate effect is a valuable practical point for the general practitioner to carry away from this meeting if he be not already familiar with it.

Dr. Engelbach referred to the fact that some have been overlooking typical cases of tetany. I think that is true. He said also that gastro-intestinal tetany is not confined to pyloric stenosis alone. There are other forms of gastro-intestinal tetany. Colonic tetany has been described. I reported a case in which there was a gastromesenteric ileus with obstruction at the duodeno-jejunal junction.

Dr. Engelbach emphasized the value of the Trousseau sign, though it is not always positive in tetany. There is a sign of the lower extremities, which corresponds to the Trousseau sign in the upper extremities. It was described years ago by Pool, of New York, and later by Schlesinger. The Pool-Schlesinger sign is a valuable confirmatory sign in tetany.

Dr. Marriott stated that calcium was definitely diminished in amount in the blood and that this should be regarded as pathognomonic in tetany. It must be true in infantile tetany, from his studies, those of Dr. Mulherin and of other pediatrists. In adult tetany the total calcium may not be diminished quantitatively in the blood. In the tetany that follows forced respiration it was found by several observers that there was no diminution in the calcium in the blood. It is possible that the active calcium, the ionized calcium, may be diminished, although the total quantity of calcium is not diminished, and it is easily conceivable in forced respiration that alkalosis may lead to dislocation of the calcium ions and thus cause a deficiency of active calcium.

Dr. Mulherin and Dr. VanderHoof referred to a number of interesting clinical features. I was especially interested in the remarks of Dr. VanderHoof on achylia gastrica. I wish our gastroenterologists would educate us about achylia gastrica. It is common in gall bladder disease. It is present in every case of pernicious anemia, and the children of pernicious anemia parents often have achylia gastrica.

Referring to the production of tetany by passing a stomach tube or in giving an enema, I will say that anything that mentally disturbs a patient or irritates him may precipitate an attack of tetany. At the Wistar Institute in Philadelphia, Hammett found that if he took out the parathyroids of ordinary white rats they developed tetany and died. But if the parathyroids are taken out of "gentled" rats they live without the development of tetany, a very interesting observation. If the rats are greatly frightened, they will develop a tetanic attack, but "gentled" animals can have parathyroidectomies done without developing tetany.

Dr. Roberts (closing).—I know of no more interesting mental experience than to read Trousseau's article on tetany in his "Clinical Medicine," and also Erb's article in Ziemsens' old "Encyclopedia of Medicine," published in 1871, and then to read Barker's exhaustive article in his work on "Endocrinology and Metabolism," and the papers of Marriott and Howells. The volumes of Trousseau's are to be found in the new Sydenham Society publications and may be

obtained from the Lewis Book Store, Gower Street, London, at a shilling a volume.

I would like also to call attention to the fact that Trousseau discovered his sign by accident. He was standing by the bedside with a young medical man who was bleeding a patient who had tetany, and noticed that when the tourniquet was applied it gave this sign or the contraction of the muscles.

The chemical study of Dr. Marriott and Dr. Howells is a triumph of American medicine.

It is interesting to know that the calcium necessity of the adult is about 0.7 gram daily in terms of calcium oxalate. A gram and a half is necessary. More of it occurs in cauliflower than in other foods. Oat meal is particularly full of it, and is a good food not for that reason alone.

I have been interested in the different statements as to the frequency of tetany. This Symposium raises a question—is there more tetany than we see?

THE VALUE OF THE GLUCOSE TOLERANCE TEST IN THE DIAGNOSIS OF MALIGNANT GROWTHS OF THE DIGESTIVE TRACT*†

By Sidney K. Simon, M.D.,
and
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In 1920, Friedenwald and Grove[1] published the results of their observations on "The Blood Sugar Tolerance Test as an Aid in the Diagnosis of Gastro-Intestinal Cancer." Recently, the same authors[2] have summed up their results with this test in a total of seventy-five malignancies and conclude as follows:

"From our further study of the blood sugar tolerance test in malignant as well as in benign disease of the gastro-intestinal tract, we are more fully convinced that this test may be utilized to great advantage as a means of differentiating between these affections, and that while it cannot in any way be considered specific for carcinoma, when taken into consideration with other clinical evidence, it may serve as a valuable aid in diagnosis in obscure cases of carcinoma of the gastro-intestinal tract."

As early as 1885, Freund[3] noted the rather constant occurrence of hyperglycemia in malignant conditions and Trinkler,[4] in 1890, found in all cancerous patients examined a hyperglycemia, most marked in carcinoma of the internal organs.

Rohdenberg, Bernhard and Krehbiel,[5] in 1919, published observations on the glucose tolerance test in malignant conditions, including in their observations growths from various parts of the body. They described curves or reactions after administering glucose, which, while not specific for carcinoma, yet in the absence of other conditions capable of giving such a curve, might prove a valuable aid in diagnosis. The same authors,[6] in 1920, reported their results in a series of 228 cases of malignancy, in various locations, and conclude:

"It is evident from the data here presented that the organism may respond in one of three ways after the ingestion of 100 gm. of glucose. Neither of these three reaction types can be considered as diagnostic of any given pathological condition, though, in general, conditions associated with increased growth energy show a higher percentage of Type I reaction. There is no fixed type of reaction, even in metabolic disturbances; absolutely similar curves being found in conditions as widely different as diabetes, tuberculosis, epithelioma and pregnancy."

Langston,[7] also, in 1922, reported the results of his observations with the glucose tolerance test in carcinoma. Curves were described similar to those of Rohdenberg, Bernhard and of Krehbiel and Friedenwald and Grove, though the percentages of blood sugar were slightly lower. Some of his conclusions were:

"There is no sugar tolerance curve definitely characteristic of carcinoma, but most cases of carcinoma give a certain type of curve, found in comparatively few other conditions, e. g., diabetes mellitus, tuberculosis, and hyperthyroidism. He found: of 53 cases of carcinoma, 43, or 81 per cent, gave a typical Type I curve. Of 29 cases of tuberculosis, 20, or 60 per cent, gave a typical Type I curve. Removal of the tumor frequently caused a change in curve, often to normal. In some cases tissue examination showed an early malignancy, but the curve was typical. The test is of no value in carcinoma of the biliary tract complicated by jaundice."

It will be noted that hyperglycemia occurs in a variety of conditions. Apparently any condition which induces increased metabolic activity or which brings about a dysfunction or lack of coordination between certain endocrine glands often produces an increase in the

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*From the Gastro-Intestinal Department of Touro Infirmary.

†Read in Section on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Patient	BLOOD SUGAR Fasting	45 Min.	120 Min.	Condition
No. 1—O. R.	0.114	0.133	0.111	Carcinoma esophagus
No. 2—W. N. D.	0.12	0.16	0.158	Carcinoma stomach
No. 3—B. F.	0.10	0.146	0.185	Carcinoma esophagus
	0.095	0.166	0.143	Carcinoma esophagus
	0.10	0.135	0.153	Carcinoma esophagus
No. 4—L. D.	0.076	0.13	0.13	Carcinoma esophagus
No. 5—N. P.	0.091	0.166	0.133	Carcinoma esophagus
No. 6—B. P.	0.119	0.17	0.166	Carcinoma stomach
No. 7—V. de V.	0.105	0.147	0.133	Carcinoma liver
No. 8—Mrs. M. R.	0.117	0.15	0.15	Carcinoma stomach
No. 9—F. L.	0.09	0.142	0.22	Carcinoma liver
No. 10—Mrs. M. P. D.	0.085	0.20	0.29	Carcinoma descending colon
No. 11—C. G. D.	0.075	0.090	0.150	Carcinoma stomach
	0.075	0.16	0.28	Carcinoma stomach
No. 12—E. K.	0.09	0.16	0.08	Carcinoma rectum
No. 13—Mary M.	0.10	0.10	0.10	Carcinomatosis
No. 14—F. J.	0.058	0.190	0.281	Carcinoma esophagus
No. 15—H. N. C.	0.09	0.190	0.25	Carcinoma cecum
No. 16—A. J.	0.118	0.20	0.08	Ulcer
No. 17—W. O.	0.117	0.129	0.13	Ulcer
	0.085	0.121	0.066	Ulcer
No. 18—W. H. S.	0.10	0.14	0.12	Ulcer
No. 19—Mrs. G. A. M.	0.08	0.16	0.12	Ulcer
No. 20—F. H.	0.095	0.154	0.111	Ulcer
No. 21—T. T.	0.093	0.128	0.107	Ulcer
No. 22—W. P. McC.	0.094	0.137	0.115	Ulcer
No. 23—G. T.	0.093	0.115	0.085	Ulcer
No. 24—W. G.	0.10	0.111	0.10	Ulcer
No. 25—A. P.	0.10	0.11	0.09	Ulcer
No. 26—W. D.	0.10	0.166	0.10	Ulcer
No. 27—S. D.	0.10	0.20	0.154	Ulcer
No. 28—Miss L. K.	0.10	0.16	0.112	Ulcer
No. 29—E. L. C.	0.066	0.10	0.077	Ulcer—neurosis
No. 30—Mrs. M. B.	0.11	0.13	0.13	Ulcer—chronic appendicitis
No. 31—H. S.	0.10	0.121	0.102	Ulcer?
	0.095	0.135	0.127	Ulcer
	0.10	0.13	0.133	Ulcer
No. 32—A. E.	0.08	0.133	0.133	Ulcer?
	0.07	0.10	0.074	Ulcer?
No. 33—G. McC.	0.10	0.149	0.133	Ulcer?
No. 34—Mrs. C. C.	0.10	0.153	0.133	Ulcer?
No. 35—E. H.	0.105	0.16	0.148	Ulcer?
No. 36—W. Z.	0.83	0.166	0.166	Pulmonary tuberculosis
No. 37—S. W.	0.10	0.18	0.18	Ulcer?
No. 38—L. C.	0.08	0.12	0.13	Infec. Inf. abd. mass
No. 39—Mrs. C. F.	0.097	0.16	0.095	Cholecystitis
No. 40—Mrs. L. T.	0.124	0.23	0.133	Colitis, cec. stasis, arthritis
No. 41—R. C.	0.098	0.124	0.117	Aortitis, lues
No. 42—H. B.	0.086	0.124	0.10	Aneurysm, gastritis
No. 43—M. S.	0.083	0.093	0.111	Syphilis
No. 44—L. B.	0.035	0.10	0.02	Syphilis
No. 45—F. J. N.	0.11	0.181	0.181	Carcinoma stomach suspected

List of cases, blood sugar curves and diagnoses.

sugar content of the blood. For this reason, hyperglycemia is frequently found to accompany tuberculosis, diabetes mellitus, hyperthyroidism, pregnancy, pituitary dysfunction, and malignancy.

The hyperglycemia, in these conditions, is variously attributed by different authors to:

(a) A special call on the part of the neoplasm for an increased amount of

sugar, which stimulates the glycogenic function of the liver.[8]

(b) Disturbance of endocrine function under the influence of a toxic secretion of the cancer cells.[9]

(c) Disturbance of kidney function causing retention of nitrogen bodies, with hyperglycemia as a secondary effect.[10]

It is now generally accepted that cachexia plays no role in the production of the hyperglycemia.

To us it would seem that the hyperglycemia of malignancy is best explained on the basis of a toxic secretion of the cancer cells which disturbs the normal relationship existing between certain of the endocrine glands, chiefly the pancreas and adrenals.

That disturbance in the relationship between pancreas and adrenals probably plays a large role would seem to be borne out by the following facts: (1) the pancreas maintains a controlling influence over sugar metabolism, tending to lower the percentage of blood sugar, while the adrenals exert an antagonistic effect in raising the sugar content of the blood; (2) injections of epinephrin[12] will cause a hyperglycemia and in fact produce a blood sugar curve similar to that observed in diabetes mellitus and carcinoma after the administration of glucose; (3) the experimental removal of the pancreas in animals causes a hyperglycemia. Subsequent removal of both adrenals in the same animal causes a return of the blood sugar to the former normal level.[11]

Friedenwald and Grove,[1] in their studies, make reference to four types of curve, found under varying conditions: (1) a normal curve; (2) an atypical normal curve, found in benign conditions of the stomach; (3) an intermediate curve, usually observed in carcinoma not associated with the gastro-intestinal tract; and (4) a cancer curve, occurring with fairly constant frequency in cancer of the digestive tract.

Under normal conditions the percentage of blood sugar rises rapidly after the administration, by mouth, of approximately 100 gms. of glucose, generally reaching its greatest degree of concentration in the blood, about 45 minutes after ingestion and falling almost, if not quite, to the original fasting level within two hours. In diabetes mellitus, carcinoma, tuberculosis and hyperthyroidism the blood sugar curve generally attains a relatively high level in 45 minutes and maintains approximately the same level at the end of a two-hour period. This is known as a high sustained curve.

With the view of determining the value of the glucose tolerance test, the authors have undertaken a series of clinical observations, not only in cases of carcinoma, but likewise in other disease states of the gastro-intestinal tract.

All of our blood sugar estimations have been determined by the method of Folin and Wu. Except in a few instances, in which 100 gms. of glucose were administered, the patients were fed 1.75 gms. of glucose per kilo of body weight, dissolved in 250 to 300 c. c. of water flavored with lemon or orange juice.

Other methods have been employed by various observers for determining blood sugar percentages, which vary somewhat in their values. Friedenwald and Grove, whose work has interested us particularly, make use of the picric acid method of Epstein and their readings are therefore somewhat higher than those obtained by us.

A total of 52 glucose tolerance tests were undertaken by us upon 45 patients. Of these, 15 had definite carcinoma, proven either by operation, post mortem examination or by highly conclusive clinical evidence. They were located as follows: esophagus, 5; stomach, 4; liver, 2; cecum, 1; descending colon, 1; rectum, 1; and carcinomatosis, 1.

Of the 15, 9 cases, or 60 per cent, gave a typical high sustained curve. One case gave a high but atypical curve, and in 5 of the cases there was not a high sustained or atypical curve. Of the 5 negative cases, 3 were esophageal, 1 was rectal and 1 presented a diffuse carcinomatosis. Therefore, excluding carcinoma involving the esophagus and rectum, a high sustained sugar curve was present in 80 per cent of our malignant cases.

Another type of curve which, as far as we have found, has not been noted by

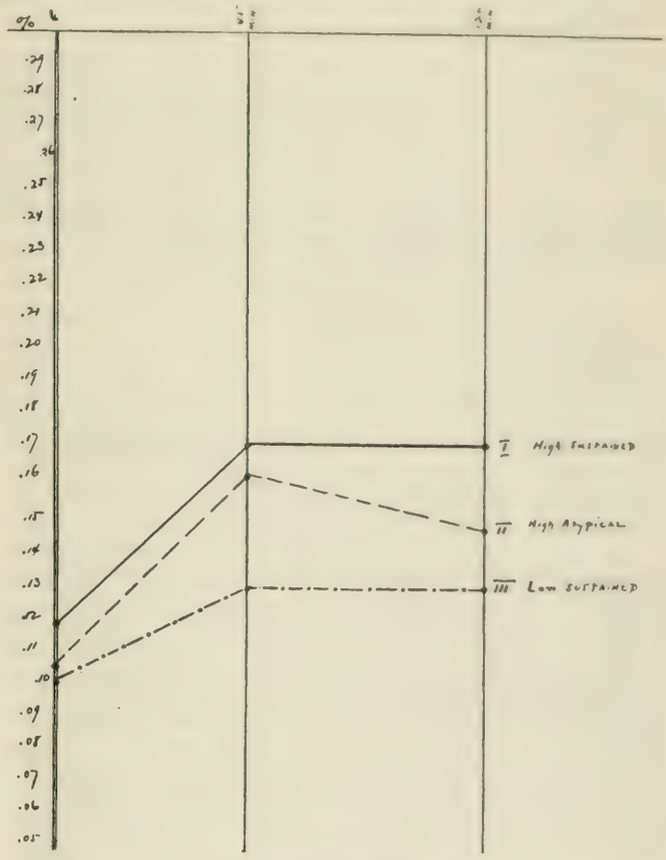
others, was observed by us, which we have designated as a low sustained curve. Only one of our malignant cases (esophagus) fell under this group.

Three distinct types of curve are thus presented as follows:

Type I (High Sustained Curve).—In this type of curve the blood sugar rises to 0.15 per cent or higher within 45 minutes after administration of glucose, and this percentage is either sustained or assumes a higher level 120 minutes after ingestion of glucose. In 6 of our series the two-hour reading was considerably higher than at 45 minutes and in 2 instances reaching as high as 0.28 per cent. A Type I curve was present in 9 of our carcinoma cases and in 3 other cases, as follows: pulmonary tuberculosis, 1 case; and suspected malignancy, not definitely proven, 2 cases.

Type II (Atypical Sustained Curve).—In this group the blood sugar rises to a point not above 0.16 per cent 45 minutes after the ingestion of glucose and drops not lower than 0.13 per cent at the end of the two-hour period. In our series, the following have been classified under this heading: 1 case of carcinoma of the liver and 3 cases tentatively diagnosed as ulcer, but in whom some suspicion of malignancy was present, but could not be proven.

Type III (A Low Sustained Curve).—In this type the blood sugar reading at the end of forty-five minutes, rising to 0.13 per cent, or slightly higher, and was sustained at that level two hours after the administration of the glucose. Five of our cases fall under the heading: 1 inflammatory abdominal mass of unknown origin, but not malignant; 1 carcinoma of the esophagus; and 3 cases of presumably peptic ulcer. We are at a loss to explain the reason for the low sustained curve in these cases. Other investigators, as far as we know, have failed to mention a similar type of curve in their studies. We do not believe it is significant of malignancy. One of the patients, who presented a low sustained curve, gave a clinical picture of pyloric ulcer. At operation no gastric lesion was found and his condition subsequently improved. Several months later the blood sugar curve proved to be normal. In another instance, in which malignancy at the pylorus was suspected, though a low sustained curve was persistently present, the further course of the malady was along clinically non-malignant lines.



SUMMARY

The glucose tolerance test was carried out in 45 cases, in 15 of whom the diagnosis of carcinoma was definitely proven. Nine, or 60 per cent, of the patients gave a typically high sustained curve. In 1 case a high but atypical sustained curve was present, yielding a total of 66 2/3 per cent, giving a sustained typical or atypical curve among our cancer patients. One case of pulmonary tuberculosis likewise furnished a Type I sustained curve.

A new type involving a relatively low percentage of blood sugar at the 45 minute reading, which was sustained to the end of the two-hour period, was observed by us. This type we do not believe of significance in the diagnosis of malignancy.

CONCLUSIONS

A certain type of glucose tolerance curve which, while not specific for carci-

noma, exists in a majority of patients suffering from carcinoma of the digestive organs. After excluding diabetes mellitus, tuberculosis and hyperthyroidism, the Type I or Type II curve in conjunction with characteristic clinical evidence, would lend strong support to the diagnosis of malignancy.

We wish to acknowledge our indebtedness to Dr. J. Lanford and Dr. Margaret Bowden, of Touro Infirmary, and to Dr. M. Couret and Dr. Aldea Maher, of Hotel Dieu, for valuable assistance in conducting the blood sugar estimations.

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DISCUSSION

Dr. Julius Friedenwald, Baltimore, Md.—The fact that a high blood sugar content is usually observed in patients affected with carcinoma has been known for many years. Freund, in 1885, was the first to point out this relation, which was again confirmed by Trinkler, in 1890. However, it is only since the blood sugar tolerance test has been extensively utilized that the significance of the variations in the hyperglycemia have become recognized. In the work of Grove and myself we attempted to utilize this test as a diagnostic means for determining the presence of gastro-intestinal cancer, and we were able to obtain the characteristic curves in most instances of this affection. While hyperglycemia is ordinarily present in cancer of other portions of the body, the well established cancer curve is not usually observed. In order, however, to utilize the test as a diagnostic measure, other affections in which hyperglycemia ordinarily appears must be excluded, i. e., diabetes, nephritis, tuberculosis and hyperthyroidism.

While the blood sugar tolerance test is, therefore, extremely helpful in the diagnosis of gastro-intestinal cancer, it occurs in so many other affections that it cannot in any way be considered specific for this disease, but when taken into consideration with the other clinical signs, it may be of considerable diagnostic help in obscure cases of carcinoma of the gastro-intestinal tract.

The following case is of interest in connection with this test: A man of 54 years had indigestion for four months, with much loss of flesh. On palpation of the abdomen a mass was noted in the right lower quadrant. The tolerance curve presented a typical cancer curve. At operation, which was performed by Dr. J. M. T. Finney, a cancer of the cecum was found. A resection was performed, and recovery took place. Two months later a normal curve was noted. A similar result was observed in another instance in which a carcinoma of the bowel was removed with a subsequent fall of the cancer curve to normal.

Dr. John A. Lanford, New Orleans, La.—This is a valuable diagnostic aid, which will assist us in bringing more evidence to bear on the possible malignancy of that portion of the gastro-intestinal tract extending from the pylorus down to the rectum. The evidence is that we have a constantly sustained blood sugar curve in most of the conditions of the gastro-intestinal tract in which there is malignancy. However, I must cite a peculiar instance we met with in our work in Touro Infirmary.

The patient presented a clinical condition of the stomach which pointed to carcinoma, and the glucose tolerance test showed a sustained curve, with the result that a diagnosis of malignancy was made. On operating there was found not a malignancy of the stomach at all, but a polypus of the gastric mucosa, which was pedunculated and sufficiently long to obstruct the pylorus, producing many symptoms of gastric ulcer, including blood in the stools and pains. Evidence like this shows that while this is a most valuable test, it is not diagnostic. It is just as valuable, to my mind, in drawing our attention to the probability of intestinal malignancy, as a two-plus Wassermann reaction is in the diagnosis of syphilis, because we do not now believe that a two-plus positive Wassermann reaction is conclusive evidence of the existence of syphilis, but must be considered with other clinical evidence or a suggestive history before we can conclude that it is the final diagnostic point. Therefore, I feel that we shall find that a sustained glucose tolerance test will be the corroborative evidence which will enable us to make a diagnosis of carcinoma of the alimentary tract.

Dr. Bryce W. Fontaine, Memphis, Tenn.—I have tried out the glucose tolerance test in several cases of malignancy of the gastro-intestinal tract and have been impressed with the sustained high curve reported first by Dr. Friedenwald and his associates. However, I have become skeptical as to the value of the glucose tolerance test since the work of Fitz. At the meeting of the Congress in Washington Fitz reported some observations of his in which he showed that varying quantities of the glucose taken with the water of lemon juice can be removed from the stomach with stomach tubes at intervals of from an hour to two or three hours. I think the test is valueless unless we have accurate knowledge of the emptying time of the stomach. If the emptying time of the stomach is considered, the test is of some value.

It is easy to see how cases of gastric stasis can interfere greatly with the absorption of glucose and vitiate the result, unless the emptying time of the stomach is absolutely known. It is curious how we get these high curves. Perhaps in the cases in which I have gotten high curves the emptying time has been all right, but I do not believe it should be considered as faultless unless we have that knowledge before us.

Dr. W. H. Olmsted, St. Louis, Mo.—In 1919 we began a study of the glucose tolerance test in a number of conditions. We have some 400 curves of various conditions, mainly thyroid disease and endocrine disturbances, as well as arthritis and other focal infections. Especially did we apply the test to all kinds of nervous people. I was working at that time with Dr. S. I. Schwab, who is interested in the effects of various nervous diseases on the glucose tolerance curves. We found that all sorts of nervous disturbances would lead to any kind of a curve. In cases of manic depressive insanity the curve would be sustained throughout. In cases of simple neurasthenia in which we could find no other disturbance both high curves and flat curves were found. Nothing was found that enabled us to predict what would be the nature of the curve, but such mental states as marked apprehension, neurasthenia and hysteria rarely gave normal curves. Thyroid cases often gave a high curve, especially the mild hyperthyroid.

After making this rather extensive study we came to the conclusion that the glucose tolerance test, involving a great deal of work, was of little value except in one condition, and that was to differentiate hyperthyroidism, nervous conditions and glycosurias that follow some of the types of fright and worry, from true diabetes mellitus. I have joined the ranks of those who are skeptical about its value from a diagnostic standpoint, because it seems to be so often influenced by the state of mind of the patient at the time the test is done. I believe that in gastro-intestinal diseases, if any reliance is to be placed upon it, it will lead more often to mistaken diagnosis than help in the diagnosis of cancer.

Dr. Simon (closing).—We entered into this study with an open mind, believing that any clinical test that would shed light on the subject of gastro-intestinal carcinoma would prove of great value. Our main conclusion, as expressed in our paper, was that while the high sustained blood sugar curve cannot be considered a specific test of carcinoma, it undoubtedly serves as a valuable aid in differential diagnosis, particularly when the clinical picture is not sharply drawn between gastric carcinoma and certain other progressive lesions involving the stomach.

The point Dr. Fontaine has brought out is well taken, and I agree with him that consideration must be given to the absorption of the glucose. Where gastric retention is present, as is frequently the case in gastric carcinoma, the test may prove misleading. However, in the case mentioned by Dr. Lanford, and quoted by us, of polypus of the stomach (Dr. Matas' case) it may be recalled that marked stenosis at the pylorus was present, with a persistent high sustained curve.

In regard to the other point brought out by Dr. Fontaine, I am under the impression that in some of the neuropathic cases we may be dealing with endocrine pathology. We know that endocrine dysfunction is a possible source of disturbed sugar metabolism in the body, so that his conclusions in regard to neuropathic patients may find their explanation from this cause.

After due consideration of the results in our cases, Dr. Smith and I are of the opinion that the test should be carried out as a routine in all doubtful gastric conditions, and particularly where malignancy is suspected.

CANCER OF THE STOMACH: REVIEW OF FIFTY OPERATIVELY AND PATHOLOGICALLY PROVEN CASES*

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For the past few years, conditions of malignancy have been brought to the attention and study of the profession as never before. This has occurred through the urgent need of a practical solution and by the stimulus which a baffling problem always lends. Gastric cancer not only shares the gravity of malignant disease in general, but it presents some problems peculiarly its own. This idea has led me to make a critical study and review of those demonstrated cases coming under our observation, with the hope of gleaning facts which would be helpful in a direct and practical way in the consideration and recognition of this condition. Though these cases belong to the surgeon first and last, the burden of proof and the responsibility always rest upon the general practitioner and the internist for early recognition. The surgeon claims frequently, and justly, that these cases are not sent to him early enough. In the beginning, gastric cancer taxes the best diagnostic skill. Toward the end, of course, he who runs may read. Due to its insidious development, many cases do not seek medical aid until too late. There is room for

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the education of the public here. On the other hand, there is too much cancer phobia among dyspeptics. A negative diagnosis can give reassuring relief.

In this series of cases the age of greatest incidence is between 40 and 50, the most productive period of life. This fact alone lends stimulus to efforts toward combating the disease. As Bloodgood says: "It is usually the well-nourished woman who gets cancer of the breast. It is the vigorous man over forty who is more apt to suffer from cancer of the lip, tongue and stomach." Hoffman's statistics show the cancer death rate in civilized portions of the world increased 23.3 per cent in the past decade. In gastric cancer, hospital record statistics are relative and not representative of the total population. The table below gives gastric cancer admission rates in representative American and English hospitals:

Hospital	Total Admission	Stomach Cancer
Johns Hopkins	8,464	150
Massachusetts General	11,812	129
Montreal General	9,454	54
St. Thomas, London	18,958	98
St. Bartholomew, London	23,500	106
London Temperance	4,643	20

In Smithies' large series of cases there were 921 cases in 82,000 clinical admissions. Cabot states that in his clinical experience correct diagnosis of gastric cancer was made in but 72 per cent of cases.

Mortality reports give gastric cancer 38 per cent of all cancer mortalities and show that malignancy in the stomach is more frequent than in any other site.

It seems that the increase of incidence is real and not apparent.

Sex Incidence.—Welsh's series: ratio of males to females, 5 to 4; Fenwich is 6 to 4; Friedenwald is 5 to 4; and Smithies 3 to 1. In the series studied in this paper, there were 35 males and 15 females.

Age.—From the literature, 60 to 70 per cent are from 40 to 70 years of age. In our series the youngest was 25; the oldest, 81. Arranged in decades the incidence was: between 20 and 30 years, 1; between 30 and 40, 5; between 40 and 50, 17; between 50 and 60, 14; between 60 and 70, 10; between 70 and 80, 2; and above 80, 1. It is a striking fact that the greater number of cases occurred between 40 and 50, the most productive and useful years.

Race.—The greatest incidence was among Anglo-Saxons, of course. Friedenwald's series gives a 5.2 per cent rate among negroes; in Osler and McRae's 150 cases there were 19 negroes; in Smithies' series of 921 there is not a single incidence. Neither is there a negro in the series studied in this paper. Hoffman says the disease is becoming more frequent with negroes.

Occupation.—The study of the statistics does not show that occupation has any special bearing, although Smithies comments on the fact that 32.4 per cent of his cases were farmers. In our own series the percentage is practically the same, 33.3, so that it would seem that out-of-door occupations are predominant.

Heredity.—In our series, 4 cases only gave a history of malignancy in the immediate family.

Social Status. — Williams observes greater frequency in communities well supplied with the comforts of life and much less among the ones living in the congested areas of the poor in cities, the lowest mortality being among the poor in Ireland.

Is diet and nutrition a factor? Hoffman's analysis shows a slightly higher percentage in overweights. Ochsner observes many cases showing histories of liberal eating of vegetables and fruits. There is the outstanding fact that supernutrition appears to favor malignancy, although no particular kind of food is culpable. There is no evidence to show that excessive protein intake is conducive to cancer development. Cancer is rarely found in the Indian and Esquimaux and in the laboring classes of the United States who are large consumers of nitrogenous foods. These classes show the lowest incidence of the disease.

Alcohol and tobacco seem to play no part.

In our series an analysis of the subjective symptomatology showed some facts of interest. The date of initial symptoms varied from six weeks to a number of years. In 60 per cent of cases the first symptoms occurred within two years. The main presenting symptoms

present were: sourness, fullness, regurgitation, pain, soreness, belching, choking, vomiting, gas, loss of weight and cachexia.

It is noteworthy that epigastric pain was absent in 56 per cent of cases. This symptom is not at all necessary to make up the syndrome. In only 16 per cent was vomiting the leading symptom. The variability of the symptoms occurring is to be emphasized, also the fact that the so-called classical symptoms are oftentimes entirely lacking. Thirty-four per cent showed no palpable tumor. In 10 per cent ascites was present.

In many cases gastric analysis was normal. In 50 per cent hydrochloric was present, in 50 per cent absent. In 16 per cent there existed hyperchlorhydria. Microscopic examination of the gastric contents showed the presence of pus cells in 50 per cent. I believe this is always a significant finding. The Boas-Oppler bacilli were found in most of the retention cases.

Occult bleeding occurred in 26 per cent. The hemoglobin per cent in these cases varied from 15 to 80. Some of these patients appeared neither anemic nor cachetic in the slightest. The urine showed nothing significant. Albuminuria occurred in only 10 per cent.

Diagnosis.—In the effort at early diagnosis the possibilities of existence of cancer should not be discounted in the absence of the syndrome of the old classical signs, for they are always the forerunners of the hopeless and later stage. There is no single sign that in itself is pathognomonic of gastric cancer. An analysis of the whole symptomatology must be made. If still in doubt as to diagnosis, in no other condition is exploratory operation so well justified. On the other hand, a negative diagnosis of malignancy is gratifying, for neither is it desired nor indicated to explore certain cases on conjecture. My impression in general is one of apprehension for the patient giving a history of twelve or eighteen months' duration who previously was rugged, robust and strong. "The Leube rule" is significant, namely:

"Cancer of the stomach is present in all probability if a questionable stomach disease has attacked a patient between 50 and 60 years of age, who formerly digested all food well. If such a person becomes dyspeptic without an evident etiological factor it may be assumed with considerable certainty that he is developing gastric cancer."

In our series the presenting symptom is quite varied, such as pain or distress, pressure or distention, nausea or vomiting, or weakness. In one case backache was the most prominent subjective symptom.

With the laboratory data one can be more definite. Gastric retention indicates pyloric obstruction if motility tests show a high content. A patent pylorus never shows food residue in the morning. The mere absence of hydrochloric acid is not in any sense conclusive. A great many of the cases have it in excess. A fact to invite suspicion, however, is a declining acidity in repeated tests.

A logical manner to interpret confusing gastric symptoms is a classification according to the situation of the growth, namely, as follows:

(1) Growth at the pylorus comprises the largest number of cases and the symptoms are of pyloric irritation, spasm and stasis, producing pain, fullness and vomiting.

(2) Growth on the anterior or posterior surfaces. Early subjective symptoms are inconspicuous, while later the greater invasion produces local irritation, hemorrhage or melena.

(3) Growth at the cardia produces choking, regurgitation and difficult swallowing.

(4) Growth invading anterior and posterior surfaces produces a patent rigid tubular effect, giving extremely rapid emptying, no pain and no vomiting.

The microscopic examination of the gastric contents gives valuable data, especially the presence of pus cells. The Boas-Oppler bacilli are found in the retention cases.

The glycyltryptophan test is variable and was not used in our series. Smithies reports that he found it positive in one-third of proven cases. In his experience the Wolff-Junghans test is more constant than absent HCl, presence of lactic acid, or the glycyltryptophan test.

The occult blood fecal test, when constant, is valuable if the patient has been on a meat free diet. A negative fecal occult blood is especially valuable when there is an atypical tumor and a doubtful history.

Friedenwald and Grove have reported their findings in the blood sugar tolerance test as an aid in the diagnosis of gastro-intestinal cancer. They observed that the curve in carcinoma of the gastro-intestinal tract shows a high sugar content even in the fasting state, with a rise to 0.23 or higher within forty-five minutes after taking dextrose, remaining at this level for two hours.

The roentgenological signs are of extreme diagnostic importance in gastric cancer and Carman believes 95 per cent of cases will present roentgen evidence. The more important of these signs are:

(1) Filling defects on either curvature caused by infiltration of new growth.
(2) Alteration of pyloric function.
    (a) Patent pylorus.
    (b) Obstructed pylorus.
(3) Variation of peristalsis.
    (a) Absence of peristalsis from involved area.
    (b) Weak peristalsis.
    (c) Anti-peristalsis.
    (d) Exaggerated peristalsis.
    (e) Irregular peristalsis.
(4) Altered motility.
    (a) Rapid emptying.
    (b) Delayed emptying.
(5) Alteration in size.
    (a) Contraction.
    (b) Dilation.

In the early diagnosis of special importance are annular defects at the pylorus, especially if associated with a pre-pyloric filling defect.

A study of cancer of the stomach would not be complete without a consideration of the much discussed question: does cancer develop from the peptic ulcer? Wilson claims 60 per cent of cases give a history of ulcer, Graham 42 per cent, and Smithies 47 per cent. McCarty, of the Mayo Clinic, in answer to the question, says: "It cannot be answered, but we know that carcinoma and ulcer are associated enough for it to be very important." Stockton says: "Those internists who see many cases of ulcer basing their statements on final results, believe that in not more than 5 to 15 per cent of cases cancer begins as ulcer." On the other hand, Mayo, Rodman, Munsford and Stone believe that most frequently cancer follows ulcer.

It would appear that there is a percentage of cases of cancer, developing as sequelae of old ulcers, also a percentage of cases appearing as primary. The last word has not been said in answer to this question.

It is interesting to note that cancer of the duodenum is rare, occurring only in 0.34 per cent of all malignancy. Duodenal ulcer is four times as frequent as gastric ulcer and cancer develops most rarely. Probably this paradox is to be explained through the possibility of some defensive process in the duodenum.

In conclusion I should like to emphasize:

(1) Early stomach cancer presents no special syndrome.

(2) Dyspeptic symptoms in previously well adults should be accounted for.

(3) Patients suffering from long-continued digestive disturbances should be frequently re-examined.

(4) Thorough chemical, microscopical and roentgen examinations give positive evidence for or against an existing malignancy.

DISCUSSION

Dr. Julius Friedenwald, Baltimore, Md.—In the review of our cases made some years ago, cancer of the stomach occurred in 9.6 per cent of all the patients affected with various gastric disturbances; the maximum liability to the disease was observed to lie between the fortieth and sixtieth years (65 per cent).

Males and females were about equally affected. A hereditary history of cancer appeared in 10 per cent of the cases, but 23 per cent presented no history of any previous digestive disturbances whatever, even in the slightest degree and but 7.3 per cent gave a direct history of ulcer. If, therefore, all of the former digestive disturbances be considered as due to ulcer, the formation of gastric cancer from ulcer could not have taken place in more than 23 per cent, which is quite at variance with the views generally held by surgeons. The gastric secretion in a recent series of cases shows an absence of free HCl in only about one-half the cases. Lactic

acid was present in 80 per cent of the cases in which free HCl was absent.

The Wolff-Junghans test for dissolved albumin was present in 80 per cent of the gastric cancers presenting an absence of free HCl, and Boas-Oppler bacilli were present in about a similar proportion of cases under like conditions. The characteristic curve of blood sugar tolerance was present in about 90 per cent of our cases and the test for occult blood in the stools in 92 per cent. The most important x-ray evidence of cancer is a filling defect which is constant in all plates. In our experience in the early stages, however, it is frequently impossible to determine whether we are dealing with a malignant or a simple ulceration, so that the roentgen diagnosis is not always positive.

Of 284 cases which came to operation or autopsy, the location of the growth was as follows: in the pyloric area, 58 per cent; in the cardiac area, 6 per cent; in the lesser curvature, 8 per cent; in the greater curvature, 4 per cent; in the fundus, 2 per cent, and general involvement of 20 per cent. Inasmuch as it is our especial aim, as Dr. Fitts has pointed out, to arrive at an early diagnosis of the affection, the difficulties arising are quite evident, for many signs are general manifestations frequently present in other gastric affections, and are not characteristic of this condition alone, while those which are more characteristic are usually late developments, such as the formation of a palpable tumor, cachexia, etc. In reaching definite conclusions it is, therefore, important to rely not upon a single sign or symptom, for there are not any pathognomonic signs of early cancer. Only after a critical review of the history, physical examination and study of the symptoms, including examination of the gastric contents, stools and blood can definite conclusions be drawn.

It is most important, too, to remember that gastric cancer usually appears at the age in which arteriosclerotic changes have already manifested themselves, on account of which there are retrogressive changes and impaired metabolism with loss of strength, with symptoms often akin to those of cancer. There is at this period of life a tendency even to a diminution of the gastric secretion with an absence of free hydrochloric acid, and this, too, may further complicate the diagnosis.

Further difficulties often arise by the occurrence of gastric cancer in patients suffering with some preceding affection, such as diabetes, chronic Bright's disease, cardiac affections, and chronic infections, on account of which there is often marked emaciation, loss of strength, and indigestion. The presence of a carcinoma may, therefore, easily be entirely overlooked. Finally, there still remains another group of cases, known as latent cancers, in which symptoms are not revealed until late in the course of the disease, and at times not at all. As yet, it is impossible to reach very definite conclusions at the early stage of the disease, except in rare instances. But it behooves us to observe carefully all of our cases of gastric disturbances and to view with suspicion all patients over forty years of age who show no improvement after a short course of medical treatment, and to urge upon such cases the need of surgical interference with the possibility of obtaining a radical cure.

Dr. A. W. Calloway, Asheville, N. C.—Where a patient has previously enjoyed good health and reaches the age of 45 or past and reports a sudden loss of weight, whether he has symptoms or not, it is a good idea to suspect malignancy.

The Boas-Oppler bacillus is a product of gastric retention. I remember a man of 30 with cancer of the stomach who had no disturbance of hydrochloric acid. He had no hemorrhage and yet had a malignant fundus. Cases of vomiting usually come from pyloric involvement and we are apt to be influenced by a change for the better. In my work I find it is difficult to get cases to submit to an exploratory operation until they have marked symptoms, and then they want to have it done as a last resort. All suspected cases should be explored surgically.

In dilatation a deformed cap is not of much value. When called upon to relieve these cases we are apt to give them opiates. I have found that four grams of bismuth in four ounces of castor oil will overcome the stasis and make the patients comfortable. I got this idea from Dr. Kemp, of New York. If there is a medicine upon which we can rely it is bismuth and castor oil. If I were given the choice between it and morphin to make a patient comfortable, I should prefer the former.

I have a case under observation now that has gained five or ten pounds in weight, and feels so encouraged that he does not want to have anything done.

Dr. George M. Niles, Atlanta, Ga.—There are many people, possibly intelligent people, who in the presence of any digestive disturbance have the fear of cancer at once. If we are able to eliminate that fear, we have clinically helped the patient that much. People consult us who have not the slightest indications of cancer. They have no cachexia, no organic trouble, but are simply obsessed with cancer phobia, and when I find there are no indications of cancer and I tell them so, I feel I have always accomplished something.

In regard to the absence of hydrochloric acid, it is a physiologic fact that if there is a neoplasm which does not affect the cells of the middle zone of the stomach, there is no reason why it should change or interfere with the secretion of hydrochloric acid. That is why in so many cases the pyloric or the cardiac end is affected. There is no change in the hydrochloric acid content of the stomach.

As to the presence of lactic acid or the Boas-Oppler bacillus, that depends upon the amount of stagnation. Cancer is a material trouble, and the roentgen ray is an aid in its diagnosis. However, we must not rely on any one agency or method in making a diagnosis of cancer. We have to take into consideration all well-known clinical methods. If we consider the cancer changes and the appearance of the stomach, if

the disease has advanced to any extent, I believe I am safe in assuming that if a man uses his judgment and common sense in correlating the clinical symptoms plus the aid he gets from the roentgen ray, intelligently interpreted, he will come nearer to making an early diagnosis of cancer, one where real aid can be rendered, than by any other known method.

Dr. J. Russell Verbrycke, Jr., Washington, D. C.—I want to stress three points, one of which is that unless carcinoma of the stomach produces obstruction it is apt not to give any pain or only slight pain. If a patient complains of exquisite abdominal pain and there is no obstruction, he has most likely not carcinoma of the stomach.

Any patient undergoing medical treatment for ulcer in which occult blood persists in the stool after two weeks' treatment, should be considered presumably as a case of incipient carcinoma.

The third point is to insist upon an exploratory operation. I will go a step further and say make it not only in the early cases, but in the so-called inoperable cases.

I recall very vividly five cases diagnosed as so-called inoperable carcinoma. The patients were explored and empyema of the gall bladder found. These patients are well today. If they had been unoperated upon they would have died within a short time, and the mistake in diagnosis would never have been discovered. Since we cannot always make a positive diagnosis of cancer of the stomach, these patients should have the advantage of an exploratory operation which can be done under local anesthesia without subjecting them to any risk whatever.

Dr. John L. Jelks, Memphis, Tenn.—Wherever there is pathology or symptoms that would lead one to believe or to fear that a patient has cancer in the stomach or ulcer in the stomach, that case is worthy of an exploratory incision, and then with our hands and our eyes we make the diagnosis. It is a sad fact that we do not, as a rule, feel a mass until we have inoperable cancer, if it is cancer. The x-ray may fail just as our hands on the outside of the abdomen and other means of diagnosis.

I recall now a case that was said to be cured in a few months by x-ray treatment for inoperable carcinoma with an immense mass in the stomach. Was it cancer? I say no, of course, it was not cancer. There was an error made in diagnosis which could have been cleared up by an exploratory operation. Another surgeon and I refused to open the abdomen because we believed the case was hopeless. When we fail to make a diagnosis of cancer from the signs and symptoms, the best diagnotic means is to open the abdomen.

I would like for Dr. Fitts to give us the end results of these fifty cases.

Dr. Fitts (closing).—I am glad Dr. Friedenwald gave the symptomatology in his recent cases.

Dr. Verbrycke said it is customary to find occult blood in the stools. Occult blood in cancer is of great diagnostic importance when persistently and continuously found.

Out of this series of fifty cases there is one case of particular interest. The patient was a woman, 45 years of age, referred to a surgeon for symptoms of chronic appendix and chronic cholecystitis. She was operated upon and chronic cholecystitis was found. The surgeon, in exploring the stomach, found a small mass about the size of the end of the thumb on the posterior wall, high up near the cardia. This was excised, examined, and proved to be adenocarcinoma. She is living today. The operation was done ten years ago. It is an interesting case because it represents ideal results.

RENAL GLYCOSURIA: REPORT OF THREE CASES*

By I. I. Lemann, M.D.,
New Orleans, La.

These cases are reported both because of the desirability of adding to the scanty number already on record and because each of them presents a special point of interest. D. S. Lewis,[1] in his recent report of three cases (including one previously reported), comments upon the fact that up to 1915 he and Mosenthal had been able to find in the literature

"less than ten cases which were described in sufficient detail to warrant their acceptance as instances of true renal glycosuria, but since that time at least nine other cases have been noted."

These would make with Lewis' new case less than twenty-five cases and in some of these a question has been raised as to whether they are properly included in the category. Since Klemperer's[2] original description, each successive writer has set down in identical terms the criteria by which cases of glycosuria are to be judged as being of the true renal type. These are: (1) glycosuria without hyperglycemia; (2) little or no relation between the carbohydrate content of the food and the output of glucose in the urine; (3) absence of all manifestations of true diabetes mellitus; (4) prolonged period of observation during which the patient shows no tendency to develop diabetes.

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*Read in Section on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Case I.—A. T., a young Russian Jew, aged 21, a recent immigrant, employed as a helper in the pharmacy of Touro Infirmary, was sent to the out-patient department in the spring of 1916 because of anorexia, constipation, and loss of weight. After several weeks of observation, during which no definite diagnosis was arrived at, he was admitted to the indoor service. In the ward he had a pulmonary hemorrhage. B. tuberculosis were discovered in his sputum and sugar in his urine. Provision was made by the Social Service for his care in the ozone pine woods region just outside of New Orleans. In July, 1916, he had hemorrhages for three days. Altogether he lost about a cupful of blood. By October, 1916, he had gained twelve pounds. Physical examination at that time showed an extensive process in both upper lobes. His temperature, taken in my office in the afternoon, was 99.8° and his pulse 120 sitting. The urine showed no sugar, but a few hyaline casts.

April, 1917.—He had had no fever for two months, but pleurisy and several hemorrhages in February, 1917. He had gained twenty pounds (weight 138). There was no sugar in the urine.

April, 1919.—His weight was 154 pounds. Physical signs were as before. His temperature had not gone above 99°. Pulse was 104 sitting. He had influenza in 1918. Urine had no sugar.

January, 1920.—His weight was 155 pounds and temperature 99°. Pulse 80 sitting. There was extensive involvement of the right lung, upper lobe, with signs of cavitation. The process in the left lung was considerably less than in the right. Fluoroscopy revealed a cavity in the right lung. Urine (passed in office) showed: sugar trace, few hyaline casts. Blood sugar (fasting stomach) 0.107%. Urine, 24-hour specimen, sugar trace.

April 8, 1920.—Urine (fasting stomach) no sugar.

One hour after ingestion 108 grams glucose, sugar 2%.

Two hours after ingestion 108 grams glucose, sugar 1%.

Three hours after ingestion 108 grams glucose, sugar heavy trace.

Four hours after ingestion 108 grams glucose, sugar faint trace.

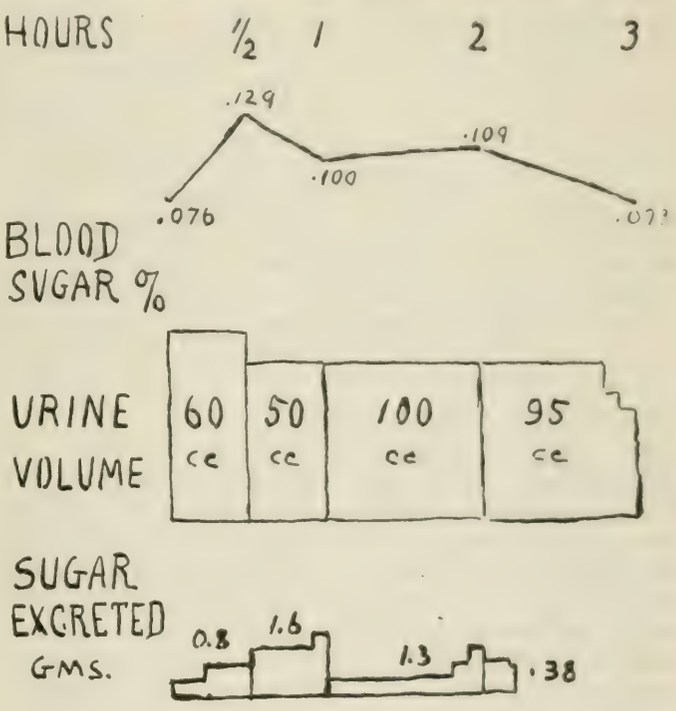
Patient refused to submit to vein puncture to take blood specimens.

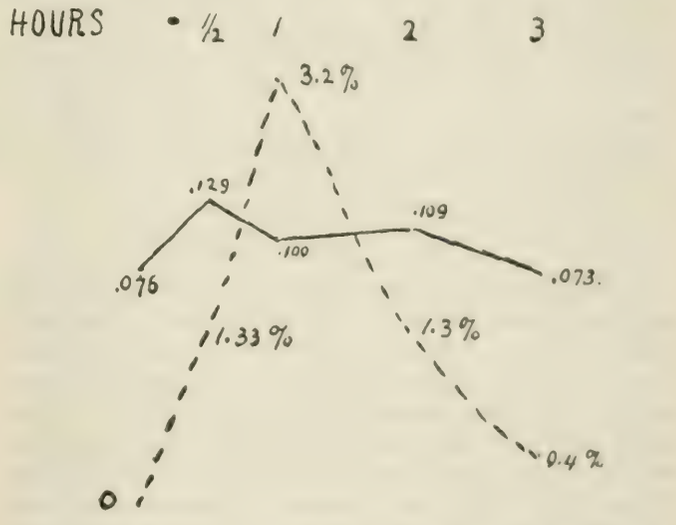
April, 1921.—He had no cough, temperature was not above 99°, and weight was 160 pounds. Lungs showed extensive dullness with bronchial breathing as before, but no rales. Urine sugar, trace.

Blood sugar curve (meal consisted of 126.8 glucose equal to 1.75 grams per kilo in 500 c. c. water):

	Blood
Fasting	0.076
One-half hour after glucose meal.....	0.129
One hour after glucose meal.....	0.100
Two hours after glucose meal.....	0.109
Three hours after glucose meal.....	0.073

Summary.—A young individual, 21 years old, was observed for a period of over six years, during which his pulmonary tuberculosis was observed to progress to cavitation and then to apparent arrest. While on full diet he showed inconstant traces of sugar in his urine with normal blood sugar and when submitted to a glucose tolerance test he showed a low renal





Urine Vol.	Urine Sugar%	Sugar Amt.
	Negative	None
60 c. c.	1.33%	0.80 grms.
50 c. c.	3.2%	1.6 grms.
100 c. c.	1.3%	1.3 grms.
95 c. c.	0.4%	0.38 grms.

threshold, but a normal blood sugar curve. He has at no time showed any symptoms of diabetes mellitus.

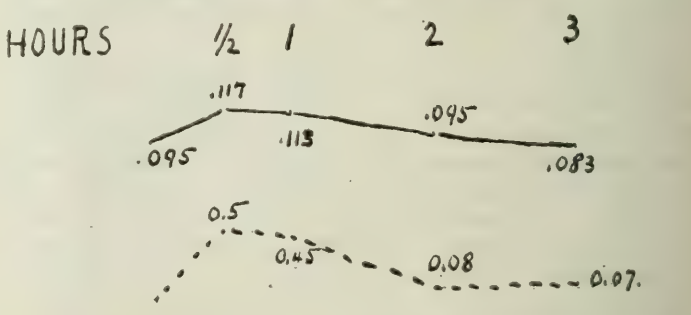
Case II.—F. B. was a male child. Sugar was discovered in his urine in October, 1919, on routine examination prior to proposed tonsillectomy and adenoidectomy. The boy at that time was three years and four months old, the youngest of three children. A fourth child has since been born, following whose birth the mother died of pulmonary embolism. Both she and the father were always well. The paternal grandmother is thought to have had diabetes in the later years of her life (she died at 76), otherwise the family history is without importance. The patient was a full term child and had always been vigorous, his only illnesses having been measles at thirteen months and whooping cough in his third year. The tonsillectomy was to be done for sore throat. The boy was well developed for his age and his weight was 32 pounds—a pound less than it was said to have been one week earlier. His appetite was said to be larger since the discovery of sugar in the urine (i. e., two weeks prior to my first examination) than it had been previously. Otherwise there were no phenomena of diabetes. The physical examination revealed nothing noteworthy beyond a liver palpable three fingers' breadth below the costal margin. The urine showed practically constantly traces (0.25 to 0.5%) of sugar (reduction of copper, fermentation), no matter how the diet was varied. The same amount was present with a diet of C. 66, P. 44, F. 27, as with a diet of no value whatever. The blood sugar was 0.102% (Folin) on a fasting stomach. The administration of 28 grams of glucose in 250 c. c. of milk on a fasting stomach at 9 a. m. had the following effect upon the sugar content of the urine:

Urine 9 to 10 a. m., 0.29% sugar.
Urine 10 to 11, 0.40% sugar.
Urine 11 to 12, 0.57% sugar.
Urine 12 to 1 p. m., 0.37% sugar.

A blood sugar curve could not be made because of the great difficulty of controlling the child sufficiently to permit repeated vein puncture. The child has been under observation for three years. He has grown normally and in June, 1922, (aged 6) weighed 42 pounds. He has never at any time manifested any symptoms of diabetes. His urine has constantly shown the same minimal amounts of sugar when the diet was restricted, when he has stolen sweets or when, as on one occasion, he was given sweets by his grandmother as a test. In October, 1921, his blood sugar was 0.08 per cent on a fasting stomach. He had chicken pox in February, 1922.

Summary.—A child observed during three years, from the age of three to six, constantly exhibited amounts of sugar in the urine irrespective of diet. He meanwhile went through one infectious disease. His blood sugar is normal and he has shown no symptoms of diabetes. His weight has increased from 33 to 42 pounds.

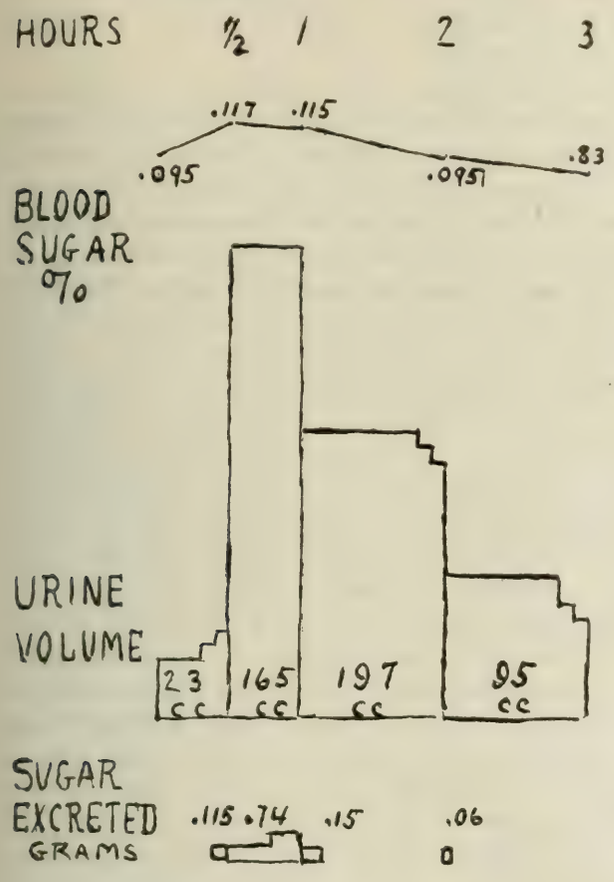
Case III.—W. A. L., a white male, aged 20 years, consulted a physician in September, 1921, because of a cough, loss of weight, lack of energy and general malaise. The doctor found nothing abnormal on physical examination, but discovered glycosuria. Because of this the patient was put on a very much restricted diet, but glycosuria did not disappear. He had lost eighteen pounds when he first consulted me in October, 1921. Most of this he had lost since being placed on the strict diet. He had previously had no appetite, had regained it for a time, but lost it again. There was no excessive thirst. The urine quantity, he thought, did not exceed one pint in twenty-four hours. There were no other phenomena of diabetes. The physical examination was negative and the Wassermann negative. The same minimal amounts of sugar (from a a faint trace to 0.4%) showed in the urine without regard to the diet. All restrictions save that of sweets were removed and the patient ate freely of bread, potatoes, baked beans, oatmeal and other cereals. With this liberal diet he passed no more sugar than he had when restricted. The urine showed in addition to the sugar a slight acetone reaction for about two weeks. The weight increased from 125.5 on October 24 to 129.5 on November 17. The blood sugar was 0.1 per cent on a fasting stomach October 25, 1921. On November 3, 1921, the blood sugar curve following a glucose meal of 93 grams in 500 c. c. of water was as follows:



CASE 3 W.A.L. SOLID LINE = BLOOD SUGAR %
DOTTED LINE = URINE SUGAR %

	Blood	Urine Vol.	Urine Sugar %	Sugar Amt.
Fasting Stomach	0.095% glucose	15 c. c.	None	
One-half hour after glucose meal	0.117%	23 c. c.	0.5%	0.115 grms.
One hour after glucose meal	0.115%	165 c. c.	0.45%	0.74 grms.
Two hours after glucose meal	0.095%	197 c. c.	0.08%	0.15 grms.
Three hours after glucose meal	0.083%	95 c. c.	0.07%	0.06 grms.

The probable nature of the trouble was explained to the patient and he was instructed to eat freely of everything but sweets and of these not at all and to report every few months for further checking.



June 21, 1922, he reported that he had felt well until two weeks before. For a while he did not eat sweets, perhaps for two months, but thereafter he did not restrict his diet in any way. His weight had gone up to 138 pounds in heavy clothes and was now 132 in light summer clothes. For two weeks he had been having in the loins sharp shooting pains lasting from a few minutes to half an hour. The pain was not referred to the front nor to the penis nor testicles. There was no pain on micturition and no increased frequency. Since that morning he had trouble in getting started. The urine passed in my office one hour after a lunch of steak, potatoes, tomatoes, bread and butter and ice cream showed a trace of sugar, a slight acetone reaction, pus and a few red blood cells. The physical examination was negative. He now stated that he had had a Neisserian infection four years before, a fact not previously disclosed. He was referred to a genito-urinary specialist, but did not go. Opportunity to examine his urine was presented June 22, June 29, and October 27, 1922, on all of which occasions small traces of sugar were present. The patient has continued to maintain his weight at the same level and has felt perfectly well. It is of special interest to note that according to the report of the patient his father had, while a young man, a similar glycosuria which has entirely disappeared.

Summary.—A young man, 20 years old, has been observed for a year, during which time his urine contained small amounts of sugar without respect to the diet. His blood sugar is normal and his glucose tolerance is normal. There are no manifestations of true diabetes. There is apparently a familial sensitiveness of the renal threshold.

The substance observed in all these urines reduces copper, ferments and yields with phenyllhydrazin osazone crystals of characteristic melting point. It usually is present in amounts not sufficiently large to permit a polariscopic reading.

DISCUSSION

Dr. J. E. Paullin, Atlanta, Ga.—There are certain differences between true renal glycosurias and mild diabetes which are determined by various laboratory procedures. However, it is not always an easy matter to differentiate between the two. Several years ago, in 1920, I reported certain observations made on a case of renal glycosuria which had then been under observation for four years. In this patient we were able to produce a slight rise of the blood sugar by feeding an excess of protein with low carbohydrate, but we were not able to produce an hyperglycemia by feeding an excess of carbohydrate. This observation has been previously made by Allen on cases of renal glycosuria. It is quite true, as has been pointed out before by Joslin, that in the beginning a very mild diabetic may present no clinical evidence of diabetes, even giving a normal blood sugar curve after glucose, and he may gradually develop the true symptoms of the disease. This has been recognized by Dr. Lemann in his cases because of the fact that he has had them under observation for several years before feeling that they belonged in the group of renal glycosurias.

The diagnosis, then, which should be made with a great deal of caution, rests on the absence of clinical symptoms of diabetes, a normal blood sugar content, little if any change of the glycosuria on increasing or decreasing the carbohydrate content of the food and a period of observation over one or two years.

Dr. Louis Hamman, Baltimore, Md.—Since the introduction of accurate and easily carried out methods of determining the blood sugar, more and more cases similar to those Dr. Lemann has reported are being observed. We will soon be in a position to have a clear clinical picture of these instances of mild glycosuria unassociated with a hyperglycemia. There are already a certain number of points that are being emphasized, particularly that this condition occurs especially in young adults and that there is a familial tendency. I have observed one family in which three young adults have had glycosuria without any of the usual symptoms of diabetes.

In two of these the blood sugar rose very little following the ingestion of 100 grams of glucose, although sugar appeared in the urine. In the third the blood sugar rose to 0.16 per cent with the appearance of sugar in the urine. It is my impression from observations on two patients that this condition often disappears as the patients grow older. However, there are a few reported instances in which after a number of years the condition became more like a mild genuine diabetes. The great practical danger is the possibility of mistaking early cases of diabetes for instances of renal diabetes, or as it has also been called diabetes innocens. Unless the studies are carried out in the thorough way in which Dr. Lemann has observed his cases there is a real danger from this possible confusion. As far as treatment is concerned, I agree with Dr. Lemann that the safest procedure is to restrict the diet so that the urine will be kept constantly sugar free. As a rule this can easily be accomplished with only slight modification of the diet.

Dr. H. Y. Righton, Savannah, Ga.—I do not rise to discuss this paper, but merely to report some cases that may come under the classification of renal glycosuria. The mother of two children, one aged 8 and the other aged 4, consulted a physician some six months ago about the younger child, claiming he had polyuria. The doctor examined the urine and found sugar. He mentioned the fact that the child showed evidences of diabetes. The older one a year previously had had the same symptom of polyuria. An examination was made of the older child with the result that the urine showed a decided percentage of sugar. The doctor, on account of the children's being well nourished and growing, did not put them on a rigid carbohydrate diet, only on a reasonable diet. These children went from under the doctor's observation for six months, at which time the younger child began again to complain of polyuria, and the mother consulted me, which was only recently. I examined the urines of both children and they showed a decided glucose test. A blood sugar test was done and the blood proved to be normal.

These children are possibly congenital syphilitics. The father gave a history of having had syphilis several years before marriage. The mother at the present time has a four-plus Wassermann after a full and intensive series of treatment. The children showed no symptoms of diabetes except the glycosuria.

Dr. W. H. Olmsted, St. Louis, Mo.—We should consider glycosuria under three general heads: first, the renal group. The second group we can call upsets of glycogenic function, characterized by the fact that before glucose appears in the urine there must be definitely plenty of glycogen in the body. Under that head come cases of glycosuria associated with nerve strain. Glycosuria must be observed for a long time before such a case can be considered one of true renal diabetes. How can one suspect that a case is diabetic, glycogenic or renal from the ordinary urine examination?

In the first place, a glycogenic upset is transitory and very often one gets a history of nerve strain preceding glycosuria. Following such a strain patients are apt to be examined by some one, and at that examination the urine may show a little sugar. Where there is a constancy of sugar in the urine, the question arises whether the condition is due to mild diabetes or to renal glycosuria. To determine whether it is a renal or a true diabetes, the sugar curve is very important. For instance, in the last two cases presented, I do not think any one would object to calling them true renal glycosuria because there was constantly present small amounts of sugar in the urine and they have normal blood sugar curves. Some one might say the first case was not true renal glycosuria, but I would call attention to the point that during the period when he did not have sugar in the urine he had an abnormally low blood sugar. We call anything renal glycosuria in which, with normal blood sugar, glucose appears in the urine. We cannot say that a case is not renal glycosuria if it gets sugar free with a blood sugar of 0.06, and it is possible that this case showed sugar with blood sugar level of 0.10, but was sugar free when the blood sugar was 0.06.

Dr. Lemann (closing).—As I recall Dr. Paullin's case, there was quite a different blood sugar curve; his blood curve had a plateau and the question has been raised as to whether his case was not an early one of diabetes. My cases did not show a plateau, but a gradual rise and prompt fall.

My first case I did not call renal glycosuria until some four or five years had passed. In the second case, although I suspected I was dealing with a case of renal glycosuria, I was not willing to accept this as the diagnosis until three years had passed. In the first case I considered that if the man had diabetes plus advanced tuberculosis he could hardly have lived six years and put on all the weight he did. His urine did not show constantly traces of sugar. His case, therefore, differed from the other two cases. The other two cases passed sugar quite independently of the amount of glucose ingested.

A Wassermann was made in all of these three cases and was found negative, and there was nothing suggestive of syphilis in the history of any of them.

PRACTICAL POINTS ON PURGATION*

By Lewis W. Elias, M.D.,
Asheville, N. C.

Four thousand years ago the Chinese were using castor oil as a laxative. The laxatives were probably among the first drugs used, and with the increase of medicine their number multiplied. Varied and powerful drugs were discovered and employed. Heroic doses were administered, that twisted and griped the intestinal tract until a mighty outpouring resulted. The practice continued and waxed strong through the ages. Finally a system of medicine arose to combat this evil, and showed that smaller and milder doses were just as effective as the harsher method. And since then mankind has enjoyed a partial convalescence from the wonders and terrors of the ancient drastics.

However, the theory still survives that the first thing in case of illness is a thorough, and often continuous, clearing of the alimentary canal. And if improvement is delayed and the diagnosis is in doubt, why, give another course of one's favorite cathartic, and perhaps at last secure a complete clearing of the intestinal tract. The logic of this view, which is frequently acted upon, is that a continuation of the disease is sufficient proof that the bowels have not been satisfactorily emptied, all other signs to the contrary notwithstanding.

In spite of this almost universal custom there are signs here and there of a change of thought in regard to elimination. This seems to arise, first, from the modern findings of physiology in the field of absorption and elimination; and second, from a closer scrutiny of clinical experience with the sick. In physiology we have learned that the principal function of the alimentary tract is to break down food into simpler forms that can be absorbed into the body, and through its mucous membrane to absorb these. The secondary function is to throw out the remaining, unabsorbed portion, left in the tract, but not the waste from the body tissues. All that is absorbed into the body tissues must, in order to get out of the body, go in company with the waste from cell activity, both the normal waste and that due to the stress of disease, together with the toxic material from germ products. And the portal of elimination for this is mainly by way of the kidneys. Minor assistance is rendered by the skin and lungs; while the eliminating function of the bowels is almost negligible.

Most food absorption takes place in the small intestines, where the reaction is acid from carbohydrate fermentation. Putrefaction takes place mainly in the large intestines, where the end products of proteid splitting are formed. Here the excessive absorption of indol, skatol, etc., may cause injury. But it must be remembered that the absorption of these putrefactive products takes place in the large bowel, and that while these putrefactive products which remain in the bowel may be removed by a laxative or enema, yet all the products which have been absorbed into the body must be eliminated through the kidneys. If we use an enema to clear the lower bowels, we accomplish all that a laxative does, and besides, we add water to the system to help wash out the absorbed toxic material. If we use a laxative we empty the intestinal tract as the enema did, but at the same time we must sweep out much yet unabsorbed food, and with it extract a large amount of water from the body tissues. A quart of liquid stool has resulted from the administration of half an ounce of castor oil The further effect of the purge is to irritate the intestinal mucosa. Microscopic examinations following a usual dose of castor oil have shown the presence of blood in the stools for two or three days. Thus we see that the administration of laxatives is not without much possible harm just as is the case with any other drug. And we see further why they should be given advisedly, and always with large quantities of water.

This loss of fluid and food is no small matter to a sick child, and with the resulting tendency to constipation in the

*Read in Section on Pediatrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

presence of an irritated intestinal mucosa, more injurious substances may be absorbed from the intestinal tract in the end than we avoided in the beginning. And since continuous depletion is in itself injurious, laxatives should be given at least in sick children with great care, and only for definite indications; and, for the sake of assisting the kidneys, always with plenty of water.

Besides the testimony of physiology thus briefly touched upon, a more careful examination of the experience of the sick has shown that purgation is not the main factor in recovery from disease; that it not only may be of small importance, but, in many cases where it was formerly considered essential, it may indeed be absolutely harmful. Formerly, no surgeon considered his patient properly prepared for operation without a preliminary purge. Now the best surgical practice, born of experience, omits this as unnecessary, and as tending to increase the post-operative discomfort of the patient. We have learned further that in intussusception, appendicitis and any inflammatory abdominal condition, cartharsis is contraindicated. These facts should put us on our guard with respect to cartharsis in many cases of obscure diagnosis.

Formerly, in obstetrics, puerperal purgation was the established practice. But the New York Lying-In Hospital, after extensive observation of comparative results, found that an enema, instead of a laxative, improved the comfort and well-being of the patient.

Of course, in typhoid we have stopped clearing out the alimentary canal with cathartics, and instead we feed our patients. Since the establishment of this practice, the younger men in the profession know only by hearsay of the convalescent famine sufferer, who was tortured by hunger, and persecuted with purgatives and intestinal antiseptics.

The same is true in colitis. Time was when we gave the "initial cleansing dose" of oil, later "relieved a congested portal circulation," then "touched up a torpid liver" with calomel, at the same time applying "an intestinal antiseptic." And with various medicines and conjuring terms we attempted to exorcise the evil spirit in the patient. But since we have stopped purging our patients, and have begun feeding suitable food, leaving the alimentary tract very largely to take care of itself (which it usually does) we have greatly reduced both the mortality and the marasmus.

It is the tuberculous men to whom we owe a real debt of gratitude for demonstrating, on an overwhelmingly convincing scale, the fact that it is not keeping the bowel empty with cathartics, but rather keeping it filled with food that enables a feverish sick man to make a successful fight for his life.

This changing from purging to feeding, thus dropping a long-cherished idea that clearing out the alimentary canal at the beginning of an illness was an essential part of the treatment, is most significant. And yet a gastro-enterologist says that he relieves more cases of nausea and vomiting by stopping the purgatives being given for the trouble than by any other measure. He further states that, if it were not for the practice among the laity of relieving constipation by purgatives, over half of his practice would be lost.

If modern physiology and clinical experience have so radically affected our practice in the ways above noted, may there not be need for a change in our use of laxatives in tonsillitis, otitis media, contagious diseases and in the widespread treatment of colds with castor oil? Would it not be a bold individual who would stand up and claim that any one had ever cured a cold since the world began, any more than that any one had ever cured measles? Yet we have taught the laity that the first thought in colds is castor oil. Would it not be better to teach them to use water and good hygiene, and a laxative only on a doctor's orders.

In all infectious diseases, at least, is not the primary consideration the elimination of toxic material and building up the patient's defenses against the disease? As elimination mainly takes place through the kidneys, is not the administration of water by mouth and by enema our best help toward elimination, while food and

good hygiene build up the resistance for the fight the body is making against the disease. A laxative depletes the tissues of water which otherwise could be used to assist the kidneys. It sweeps out food ready to be absorbed for the fight, adds to the patient's discomfort, and is generally unphysiological.

Two indications for a purge may be mentioned: first, where symptoms definitely suggest the injurious intestinal absorption that enemas have failed to relieve; second, where an edematous patient may need depletion. Some other indications will occur to you. But the point of this paper is not that laxatives should never be given, but that they should be given only for a definite indication, and with proper safeguards, and that the indications are far less frequent than our practice would indicate.

Of course, the knowledge of these facts is more or less commonplace to all pediatricians. In fact, they have been largely instrumental in furthering these views. However, one must be continually on his guard against the unconscious influence of long-established practices, under which he has grown up. Hence, let us not fail, through carelessness, to walk in the light of modern knowledge and experience rather than in the shadow of ancient custom and half truths. Give laxatives when necessary—just as we give digitalis where the need is definitely indicated—and with such safeguards as extra water, etc., bearing in mind, to recapitulate:

(1) That the alimentary canal is an absorptive organ, the kidneys doing the elimination from the body tissues.

(2) Merely because our patient is sick is no reason for a purge. Most patients are best helped by water, food and such hygienic measures as tend to build up their resistance. If the lower bowels need emptying, do it with an enema.

(3) This procedure is in line with the best thought of our time, but we are unconsciously influenced by long-established custom.

(4) Give a cathartic with the same care and thought that you would any other drug.

DISCUSSION

Dr. Charles E. Boynton, Atlanta, Ga.—Dr. Elias says the final indication for a laxative is the judgment of the doctor and that laxatives should not be used unless you think them necessary. I do not think any one of us has a routine of giving laxatives. There are places where a laxative is absolutely contraindicated. Most of the babies who come into our hands, especially after having been through hospital treatment, that is, delivered in the hospital, have already received an initial dose of castor oil. This is absolutely wrong. The babies come home and a large number of them have green, undigested stools and what has taken place is that there has been by mechanical irritation an enteritis started up and sometimes it is very troublesome to stop. I have seen from very mild, simple laxatives, for instance, liquid petrolatum, a diarrhea start up which is difficult to stop.

As to whether an acute illness should be treated by a laxative or not is a question. It depends a good deal upon how toxic the patient is. If you strike an acute indigestion which has become what we call hyperacid, with intestinal stasis, when the intestines are not moving and the patient is very toxic, this intestine must be emptied by enema, stomach washing, abdominal massage, and personally I like small repeated doses of calomel to get the flow of the intestinal contents started. If I cannot get the intestine started in this acute toxic condition, I feel that the patient is in a pretty bad way. I think one of the principal cases where laxatives are contraindicated is in appendicitis. The question was raised this morning as to whether every appendix should be taken out if it shows a slight irritation. I have seen an appendix taken out in an acute case in which appendicitis could not be demonstrated after the appendix was out. After watching a case of that kind for twelve hours, in the meantime studying the leucocytosis and using an ice bag to the abdomen as a temporary measure, if the case is progressing, I think a surgeon is justified in removing the appendix before twenty-four hours have elapsed.

As to whether the stomach and intestines can be eliminative organs or not: I have seen cases of uremia, where there was marked vomiting, which were relieved by the elimination of toxic material through the stomach by vomiting and through the intestine by a conservative diarrhea. You can supply purgatives in cases of this kind to advantage. In treating hyperacidity unless we have a nurse, we must control the amount of soda that is given very accurately, very carefully testing the urine by litmus, for we are liable to get a fatal termination from an excess of alkali. That is usually not considered as a cathartic. Finally, it comes down to the point that the individual physician has to use his own judgment. If he has judgment he will decide in the individual case whether the patient is going to be benefited by quick clearing of the intestines.

Dr. Owen H. Wilson, Nashville, Tenn.—I think it is an open question whether purging does more

harm than good. In every acute illness some of the symptoms are due to putrefaction of the intestinal content, hence the reason for an initial purgative. I do not mean that it is absolutely necessary, but we should get rid of that complicating symptom which may cause some of the temperature. There is nothing healing or curative in purging. There is nothing soothing in castor oil or calomel. Purgatives are dehydrating and especially contraindicated where there is inflammation in the intestine, except to get rid of the putrefying intestinal content. When using a cathartic be careful not to give any more food that will increase intestinal fermentation. In ordinary intestinal infections, for instance, infectious diarrhea, food feeds the germ rather than the blood.

The routine practice of giving castor oil in the new-born is much to be deprecated. Green stools do not necessarily call for castor oil. The green stool is due to some disturbance in the milk for which the nervous tension of the mother is responsible, not the baby's digestive apparatus.

Especially is a purgative contraindicated in abdominal pain. If it is fermentation a purgative would do no harm. A purgative for green apple colic would be justifiable if the diagnosis were certain, but if the pain happens to be due to appendicitis or intussusception then undoubtedly harm is done. Let us wait until we make our diagnosis and in this a white blood count is of great assistance.

Dr. A. A. Walker, Birmingham, Ala.—I have always felt very strongly that the use of cathartics in this country is carried to excess. It is a well-known fact that cathartics and purgatives are used by the American people more than by any other people on the globe. As a matter of fact, a fetish has grown up around the bowels in America which, to my mind, is a great evil. The castor oil bottle is always to be found in the nursery of the new-born baby, and I believe it is a toxic substance to a new-born baby.

The speakers have not differentiated between laxatives and purgatives. I do think there is a place in pediatrics and in medicine for laxatives, and by that I mean milk of magnesia and allied substances which are not excessively irritating.

If you take any text-book on pediatrics or general medicine, but especially pediatrics, and open to measles or to 90 per cent of the diseases, under "Treatment" you will find as follows: "A sunny room with a southern exposure should be chosen; the child should be placed in bed and a brisk purgative, castor oil preferably, should be given in doses from a dessert spoon to a tablespoon, etc." Always that brisk purgative precedes the treatment, no matter what the disease, in 90 per cent of the diseases. What is the sense in giving a dose of castor oil to a child who is having twenty or thirty movements already? Certainly the intestinal tract is being emptied so fast that castor oil cannot empty it faster. It is a well-grounded practice in some communities that diarrhea means castor oil, and as the corollary of that, constipation also means castor oil.

And there is castor oil treatment for a common cold. How many of us have had women call up and say, "Little Johnny has a cold and has had it for a week. I have given him castor oil every night. He has passed a lot of mucus, but he still has the cold." I find that it is the belief of the layman that castor oil goes through the system and in some way it works the mucus due to the cold off through the bowel. I have spent some valuable time trying to explain to women that they have not removed the mucus, but the castor oil has produced mucus from its irritating action.

I have felt rather strongly about this matter and I am glad Dr. Elias has brought it before the Section. I hope that when we go home and Mrs. Smith calls up and says Johnny has a cold we will refrain from saying, "Give him a dose of castor oil."

Dr. Theodore H. Harrell, San Antonio, Tex.—Having seen much havoc from purgatives in infancy, I am going to limit my remarks to the infant.

There are two conditions in which I recommend a purgative:

Firstly, mechanical diarrhea, diarrhea from ingested articles of food which the infant cannot digest and which remain in the intestine and by mechanical irritation set up a diarrhea, Nature's effort to rid the intestine of the enemy. Ordinarily the offending agents will be expelled without a purgative; at other times it will be necessary to give a purgative.

Do not be too hasty with the purgative. If the diarrhea is profuse it's a question even in these cases if the purgative will not do more harm than good.

Secondly, one speaker mentioned toxemia. Toxemia is a thing met with in adults and in older children. I am not sure that it is met with in infancy. If so, it is possibly of a mild type and can better be taken care of by means of a bowel flushing. At least I should attempt to correct the condition by purgative only after the enema had failed. If forced to use a cathartic use it with caution. When a purgative is administered it does one of two things—harm or good. I believe that it does good only in very rare cases, therefore it must do harm in the vast majority. Sins of commission in the infant are great, and of the sins the act of giving purgatives is the greatest.

The general practitioner and the parents do irreparable harm with purgatives. Why purge a bowel that is emptying itself fifteen to thirty times every twenty-four hours? Why does the surgeon put the fracture at rest? If the bowel needs rest, give it rest, either with the proper food or medicine. The only medicine worth while is opium. Rest the bowel with judicious doses. Don't kill the child, but get the desired effect.

I wish to call your attention to the work of the pediatrists of Chicago. Very few of them give a purgative under any but extreme conditions, conditions which I have mentioned.

For many years I have not given a dose of castor oil or calomel. I believe they have almost no place in infancy.

If we could only teach the general practitioner, the nurse and the mother that there is almost no indication for purgatives in infancy, many lives could be saved. Restore the fluid content of the body and add to this the proper feeding.

Dr. R. M. Pollitzer, Charleston, S. C.—Purgatives are universally used by the laity, especially on babies, because of the teaching of the older generation of doctors who have passed on. We tell people very positively what to do and they do those things. Later on perhaps a new generation finds out in the light of more modern investigation that we were wrong. Nevertheless the practice is continued in the household treatment. Therefore we must be cautious in the teaching of special facts to the family. Undoubtedly the doctor's function aside from the treatment and prevention of disease is to teach or educate the people to take care of themselves and their children. Nevertheless, it is a serious mistake to go into details and especially to dogmatize, conveying the opinion that all other methods are bound to do harm. We see patients treated in different cities by equally good men return with the idea impressed upon them that Dr. So and So's way or dictum is the only correct one. Frequently we find that they have been taught but some passing fad.

I believe in giving a purgative if it seems indicated after a physical examination and the taking of a history. Many doctors give purgatives without a diagnosis or even proper examination, because they feel that they must be doing something to show that they are on the job. The mother who is worried about the baby insists in one way or another on treatment and upon seeing results from a drug as calomel or oil she is satisfied. She cannot see a lung slowly resolve or a pleural exudate be absorbed, but a bowel movement is evidence that the doctor has obtained the desired result.

Dr. Lewis Smith, Milltown, Ga.—The average doctor gets his information from the authorities. When I was studying this question some few years ago I found that most of our text books recommended purgation for various diseases, that is, recommended the use of calomel and castor oil. When I asked some of these men personally whether they used castor oil or calomel they said they did not. I asked why it was in the book. One man replied that he was going to rewrite his book. He has rewritten his book, but still recommends castor oil or calomel as a routine in contagious diseases. I say, therefore, that it is not our fault because we look to these men for guidance. Not only one authority, but the best authorities in America, do this. They do not use it in private or hospital practice, but they recommend it in their books. In visiting the pediatric centers I found that the hospitals that are under the guidance of pediatricians do not use calomel, but the large hospitals where the patients are under the care of the men who do general work calomel is pretty freely used and so is castor oil. I cannot help feeling that a great deal of harm has been done by the indiscriminate use of these drugs in infancy and childhood. Where purgatives are not used we do not have deaths from infectious diarrheas, etc.

Dr. W. A. Mulherin, Augusta, Ga.—I would like to say a word for poor old castor oil, not that I advocate the dogmatic use of it. As Dr. Elias tells us, the Chinese started four thousand years ago using castor oil. It does seem logical in that time, granting that our predecessors were one-half as brainy as we are, that we could have discarded its use years ago. I know there is a difference of opinion regarding the use of it. Some are extremely against it, as in Chicago. On the other hand, some mothers consider it a daily morning act to give a dose of castor oil, believing it eliminates mucus. Both these views are extreme ones. If it were as harmful as some of the discussers would lead us to believe, we ought to have a lot more of bloody dysentery than we are at present having. I am not advocating that we use it promiscuously, but I do think the pendulum has swung too far to conservatism regarding its use. It is my personal opinion that castor oil has a distinct sphere of usefulness in the correct practice of medicine. Furthermore, it has rightfully won for itself a very well deserved position in our armamentarium.

Dr. R. C. Spence, Dallas, Tex.—Like Dr. Mulherin, I should like to say a few words in defense of castor oil. A baby who is vomiting and who is having loose stools is usually vomiting and having loose stools because there is something in the gastrointestinal tract which is abnormal; and because it is abnormal it is irritating the mucous membrane of the gastrointestinal tract. Nature, in an effort to get rid of this irritating substance, causes the baby to vomit or to have loose stools. At the beginning of such an upset I do not think the pediatrician could do a better thing than to give a small dose of castor oil. It not only aids Nature in ridding itself of this gastrointestinal irritant, but it also tends to sooth the inflamed mucous membrane of the gastrointestinal tract.

Dr. C. Hilton Rice, Jr., Montgomery, Ala.—I have two children of my own, one twelve and the other eleven, and they never have tasted castor oil. When I was a child I took it for all the family. I think I got one or two doses a week and I promised myself then that when I was old enough I would never take any more. I am in accord with Dr. Elias, but do not go quite so far as he. There are some children who take oil well. There are certain cases where it seems the choice of purgatives. When treating a child at home a dose of oil often relieves the family if it does not help the child. We see many children who will suddenly develop a high temperature and have convulsions from gastric or intestinal indigestion. In such cases a stomach washing and brisk purgation with oil or salts is certainly the treatment indicated.

Dr. Elias (closing).—Possibly Dr. Mulherin thought because castor oil was used four thou-

sand years ago it must have some merit. Our ancestors used blood-letting very freely a generation ago, but we seldom use it now. Dr. Spence says if there is an irritant in the bowel in colitis it must be removed. About the only way to remove that is to resect the mucous membrane of the intestinal tract, because the irritation is the inflammation in the wall of the lower bowel. But there are still men with his view. That the thing is on a physiologic basis is the claim of the paper. Dr. Hill, of Boston, a few years ago reviewed the histories in the Massachusetts General Hospital and found that about two-thirds of the cases of nephritis in children were secondary to tonsillitis. I wrote to Dr. Hill asking what treatment he advised in tonsillitis to prevent nephritis. Strange to say, he said nothing about the use of purgatives and by purgatives I mean cathartics and laxatives. I have used the terms interchanegably. He advised giving water liberally together with hygienic care. Also Dr. Howell, of Baltimore, the physiologist, states in a letter: "I quite agree with you that probably an enema is more physiological and sensible than a cathartic." Dr. W. B. Cannon, of Harvard, said: "I think you are right in assuming that cathartics have no effect in eliminating toxic material from the body itself. All they do is to discharge from the alimentary tract material which has not been introduced into the body. There is very little elimination from the body into the alimentary canal."

All I ask you is that when you give a cathartic give it not because the patient is sick, but give it in the light of experience and of physiology.

DIPHTHERIA WITH UNUSUAL COMPLICATIONS*

By Arthur G. Jacobs, M.D.,
Memphis, Tenn.

On January 10, 1921, I was called to see an eight-year-old girl, who complained of a sore throat, difficulty in swallowing, and fever. Her parents were living and in good health. She had one brother living and in good health and had lost a sister two years before from diphtheria. The patient had always been well, aside from an occasional cold or sore throat. She had had no communicable disease previously. The present illness began five days before my visit with slight fever, sore throat and general malaise. The mother had administered a purgative and she seemed better for a few days. The condition then became rapidly worse and the mother sought help.

She was a well developed girl, eight years old and large for her age. The musculature was firm, color pale, lips pink, temperature 101°, pulse 130, and respiration 30. Examination of the throat showed enlargement of the tonsils with marked peri-tonsillar swelling of the left side. Both tonsils were covered with a ragged, dirty gray membrane. There was considerable glandular enlargement of both sides of the neck, greater on the left, and much odor from the mouth. The heart showed no murmur and no irregularity of action; the rate was rapid. The heart boundaries were normal. The lungs negative. Liver and spleen were normal. Pupillary and patellar reflexes were normal. A swab was made which was later reported negative by the Board of Health. The following morning her temperature was 100°, but the left side of the throat was more swollen and painful and the condition had the appearance of a peri-tonsillar abscess. An incision was made behind the left tonsil and considerable pus evacuated. It was found on making the incision that the membrane was very tough, a fact which made me more suspicious of diphtheria. I at once administered 20,000 units of antitoxin and followed with 10,000 the next morning. Other swabs were taken, which proved positive, justifying the administration of antitoxin. Her condition rapidly improved and in four days the membrane had completely disappeared. The swelling on the left side had almost entirely abated and aside from a slight oozing from the incision appeared normal. The child improved generally for about one week, at the end of which time she grew weaker, her pulse became irregular and slower, and a distinct murmur, systolic in character, was heard at the apex. The heart boundaries showed distinct increase in area, extending to the left, one inch beyond normal and the apex one inch to the left and half an inch below normal. The pulse rate reached 50 and continued at a range 50 to 60. At the end of that time it rose rapidly to 120, 130 and 140. A distinct arrhythmia developed and the child appeared desperately ill. On the sixteenth day her extremities were cold and it was not possible to get response to the application of heat. This kept up for one week and she awoke one night complaining of a severe pain in both legs. The next morning tiny red spots and streaks appeared on the dorsal surface of both feet. In a few days all toes on both feet became purple and in the course of several days thereafter, black and dry. This distinct discoloration continued to advance up the legs, finally reaching the knees.

During this time the pain continued, responding slightly to hot packs. The temperature now ranged from normal to 102°. The pulse increased in rapidity, but the arrythmia and murmur continued. On February 11, amputation of the left leg at the lower third of the thigh was done. On February 13, amputation of the right leg at the lower third of the right thigh was performed. Blood examination on the day of amputation gave the following:

Hemoglobin	69%
Erythrocytes	3,960,000
Leucocytes	15,400
Small lymphs	18%
Large lymphs	5%
Polymorphonuclears	77%

Serum reaction—blood clotting—3.10 seconds.

*Read in Section on Pediatrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Urine Examination:

Color	dark amber
Reaction	alkaline
Specific gravity	10:18
Sugar	negative
Albumin	faint trace
Casts	occasional epithelial
Epithelium	few squamous
Pus cells	few

Pathological Findings.—Dry gangrene lower half left leg from thrombosis of popliteal artery. Culture of the popliteal was negative.

She was dismissed cured April 7 and now is in first-class physical condition. She is able to walk and even run through the aid of an apparatus which she wears. Her heart boundaries are normal and the tones pure.

Gangrene following diphtheria is a very rare complication, as but few cases have been reported in the world's medical records. The case now under consideration is the fifth to be reported in America. The first was reported in 1879 by Vedder, the second in 1894 by Ware, the third in 1894 by Munn, while the fourth was a report of gangrene of the feet following diphtheria by Gordon and Neuman in this year's February number of the *American Journal of Diseases of Children.*

The Klebs-Loeffler bacillus lodges in a wound of the mucous membrane, usually of the pharynx or nose. At the site of invasion fibrinous exudate forms, this being the characteristic clinical symptom of diphtheria. The psuedo-membrane results from degeneration and necrosis of the cells, and there is an increased fibrinous exudation and thickening of the membrane. The bacilli are concerned in two processes, the formation of the false membrane and the elaboration of toxins. The diphtheritic toxins are carried by way of the lymphatics and blood stream to other locations. As the membrane spreads locally, a greater surface is created for the absorption of toxins, and greater saturation of the body occurs. The most important pathological change occurs in the heart muscle.

Councilman, Mallory and Pearce found some degree of fatty degeneration of the cardiac muscle in a great many of their cases. The degeneration may be limited to special foci or involve the general myocardium. The absorbed toxin produces these changes. Next in importance to cardiac pathology are lesions of the nervous system. While the nature of this phenomenon is still a matter of discussion, it is generally agreed that the changes consist of degeneration due to a parenchymatous and interstitial neuritis. This neuritis may be peripheral or possibly central. The peripheral nerves show degeneration of the medullary sheath and an involvement of the axis cylinder. Both motor and sensory nerves may be affected. Babinsky found atrophy of the ganglion cells of the anterior cornua of the spinal cord, hemorrhage in the gray matter of the cord, and degeneration in the anterior and posterior roots.

There is as yet no agreement as to whether the central or the peripheral nervous system is primarily affected in diphtheritic paralysis. Some think that the paralysis is due to an ascending neuritis along the peripheral nerve centers; others think it due to a lymphogenous infection, whereas such investigators as Balton and Bown regard the paralysis as part of the systemic infection carried by the blood. Walsh has a theory of a twofold mechanism. He thinks that the early characteristic paralysis is due to an ascending infection of the central nervous system; that the diphtheritic toxin passes up to the medulla in the perineural lymph channel of the cranial nerves, innervating the tonsils and fauces. The initial and essential lesion is produced by the action of the toxin on the central nervous system, i. e., on the nuclei and nerves themselves. The late paralysis is due to general systemic toxemia. This resembles multiple nueritis and is more lasting than the earlier paralysis. It is almost a rule that the toxin affects the heart, and so frequent is this the case that some authorities regard the cardiac symptom as a part of the symptomatology of diphtheria. However, this view is a little extreme, as the cardiac symptoms usually appear after the acute stage has passed, and therefore this involvement of the heart is more correctly to be regarded as a complication. Heart symptoms vary in intensity from a slight arrhythmia to the dreaded heart failure.

Paralysis as a rule begins at the site of infection, and therefore we find paralysis of the soft palate most frequent. In the presence of local paralysis the liability to cardiac disturbance becomes markedly increased. In our case there existed a palatal paralysis evidenced by a peculiar nasal voice and regurgitation of food and drink. Closely following these symp-

toms a marked arrhythmia occurred, and the rate of heart action increased until we had a typical tachycardia. This symptom soon was followed by a bradycardia and the pulse rate fell to as low as 50, 55 and 60. This continued for about one week. The extremities were cold, the patient waxy pale. Under stimulation with strychnin and camphor the pulse rate slowly increased in frequency. The slow circulation permitted an accumulation of fluid in the feet. At the same time the heart muscle was receiving insufficient blood to maintain its proper tone.

According to Bailly (*International Clinics*, 1920, ii, 157) the pathologic changes in the heart cause loss of tone in the myocardium and distention by blood pressure of the cardiac cavities. This causes change in the intra-cardiac circulation and stagnation of blood in the cavities, which brings about coagulation of the blood and the formation of emboli. Further, Bouchet and Labadie-Lagrave showed that the endocardium in diphtheria may be the site of endocarditis. Thus endocarditis of the apex may be the cause of the emboli which causes gangrene of the limbs. The author also stresses the fact that there may be a diphtheritic arteritis causing the gangrene. In our case the gangrene was due to thrombosis, the emboli being sterile.

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DISCUSSION

Dr. W. A. Mulherin, Augusta, Ga.—At what time in the illness did the toes begin to show this gangrene? Just before I left Augusta I was asked to see in consultation a negro child five or six years old, who had had a sore throat some three or four weeks before. This child's clinical picture was practically the same as the case cited. Both legs were involved, beginning at the toes and extending upward. I heard, just before I left home, that the gangrene had extended further up and amputation had been performed. A thrombus was found in the artery in the popliteal space in both legs. It was a question of the correct diagnosis. A culture was taken on account of the preceding sore throat to see if diphtheria organisms were present. It proved negative. It is of great interest to hear this case reported.

Dr. Jacobs.—It was at three or four weeks.

Dr. Lewis W. Elias, Asheville, N. C.—I have never seen a case like the one described.

Dr. Park recently, in discussing antitoxin, said that the doses did not seem to affect the mortality very greatly, but large doses did shorten the course and lessen the complications. I note that Dr. Jacobs gave 20,000 units and the next day gave 10,000. Dr. Park emphatically said there was absolutely no excuse for giving a second dose of antitoxin, that you never could undo with a second dose what you failed to do by giving enough in the first dose.

Dr. J. H. Graves, Houston, Tex.—I would like to ask the Doctor in closing whether or not the administration of antitoxin directly into the blood stream might have prevented gangrene if given by the first physician who saw the case. Being a general practitioner of medicine, I do not speak from the standpoint of a pediatrician, but I do believe that some lives could be saved if we who see such cases early would be bold enough to give the antitoxin even on suspicion. Dr. Jacobs, of course, saw this case far too late to be of service and the toxemia was too great to be influenced then.

I recall one case in which I was called in consultation by Dr. W. S. Witte, of Waco, Tex., several years ago which illustrates such a course. The patient, a little girl five years old, after attending public meetings during the Annual Cotton Palace Shows, was taken ill quite suddenly, and only two blocks distant a neighbor boy eight years old coincidentally fell ill and died later of post-diphtheritic paralysis. This little girl, when seen by me with Dr. Witte, was unconscious, stuporous, muscles relaxed so the arms, legs and head when lifted would fall with evidence of complete paralysis. Her pupils were equally dilated, bowels could not be moved; locked bowel was suspected and evidently present, yet there was no stercoraceous vomiting.

From the intense but unaccounted for toxemia and the general facies of this little patient, and the presence in the neighborhood of diphtheria, I decided to recommend administration of 40,000 units of diphtheria antitoxin after ruling out cerebrospinal meningitis and anterior poliomyelitis. True it was a shot in the dark, so to speak, but other successful practitioners had given an unfavorable prognosis. In fact, they said the patient would not live five hours.

We held a consultation and the child's family said: "If there is any chance to save her, give it." We explained that it was the only thing we could think of that offered the least hope, though it promised them nothing. To our surprise and the happiness of all concerned, this child began to improve soon after the administration and continued steadily getting better. The bowels moved with some stringy membranous materials which we believed to have been diphtheritic membranes of the intestines similar to Dr. Jacobs' membranes over the entire tonsils. This case certainly justified a shot in the dark.

Dr. John Barbee, Knoxville, Tenn.—We have much to thank Dr. Jacobs for, because we lear

by such cases that things not looked for are our greatest lessons. I would like to report a case I have under observation at the present time.

A week ago I was called by a general practitioner to see a case of diphtheria on the third day. On the second day he had made his diagnosis and administered 5000 units and the next day had the laboratory report, which was negative. I saw the baby on the third day and it was so positive to me that it was diphtheria from the appearance, the membrane covering both tonsils and uvula, that I gave some more antitoxin because I thought 5000 was not sufficient. The child's temperature on the third day was 104°. The next day it was 102°. The next day 102.5° and there was every appearance that the child was getting better. On the fourth day the temperature rose to 102.5° and on looking over the case I could not see a cause for it. On my second call I found that there had appeared a dark discoloration, like purpura, of the tips of both ears and on the extensor surfaces of both arms, a rather septic condition, with the same condition on the extensor surfaces of the legs and covering the knees. The question in my mind then was what had happened through the circulation or through the nervous system to cause the rise of temperature. It was a question whether it was a protein poison from the serum or whether it was from the diphtheria organisms or from a streptococcus infection. I recalled a case that I had seen in the Willard Parker Hospital three years ago in which a physician said he had never seen a child with marked endocarditis with purpura that recovered. Having the other case in mind, I felt very grave in my prognosis of this case, but just as I was leaving home the symptoms had all disappeared, though the child was still running a temperature above 102°. There was every evidence that she was going to get well. The question in my mind was what caused this eruption to appear in six definite places on the body and to clear up in a few days.

Dr. W. McKim Marriott, St. Louis, Mo.—This paper suggests a number of thoughts regarding the treatment of diphtheria in children. The complication that Dr. Jacobs has described is to be considered a complication of diphtheritic myocarditis rather than the diphtheria *per se.* Thrombosis and gangrene of the extremities may be observed in any form of severe myocarditis whether due to diphtheria or to other causes. Such a complication can best be prevented by the early and vigorous treatment of the diphtheria. When the diphtheritic toxin has once injured the cells of the heart muscle no amount of antitoxin can repair the damage. The antitoxin, to be effective, must be given before this damage has occurred, and in any severe case of diphtheria the antitoxin should be given in such a way as to get the maximum amount into the circulation in the shortest possible time. To accomplish this a small amount of antitoxin given intravenously is more effective than several times the dose given subcutaneously.

The second point that is of importance is that any severe case of diphtheria is potentially a heart case. If the child has an extensive membrane on the throat, especially if the temperature is high, and if administration of antitoxin has been delayed, there is danger of the development of a late myocarditis. Such a child should be kept in bed for four or five weeks. Involvement of the heart in diphtheria is more common than seems to be generally recognized, and not infrequently a child entirely recovered from diphtheria will get out of bed and die a few days later from cardiac complications.

Dr. Jacobs (closing).—As to whether this most serious complication could have been prevented by the administration intravenously of antitoxin at the time, it has been two years since I saw the case. At the time I treated it not so much was being done with intravenous administration of antitoxin as there is now, and it is very likely that I would have given the antitoxin intravenously in the hope that it would have prevented this complication. Ehrlich considers that the Klebs-Loeffler bacillus produces four different complex chemical substances, chief of which are toxins and toxons. The toxin, in his opinion, is the one responsible for myocardial degeneration. If the toxin has already brought about degenerative changes in the myocardium or elsewhere, the administration of antitoxin intramuscularly or intravenously cannot undo the harm. The child received the first dose of antitoxin after it had been sick longer than one week, and I do not believe given that late intravenously it would have prevented the gangrene. What would have prevented it would have been the immediate administration of antitoxin at the beginning of the case, on the first or second or possibly the third day, but I did not see the case then. Speaking generally, I believe that antitoxin intravenously will give quicker and more decided results than we get with the intramuscular administration, but intravenous injection as late as the seventh or eighth day in my opinion would not have prevented it.

With regard to the administration of two doses of antitoxin I gave 20,000 units as the first dose and followed with 10,000. At the time I gave the 20,000 it was in the face of a negative report from the Board of Health. While there are several reasons for a negative report, I took the responsibility on myself. I was also misled somewhat at first glance by the presence of a peritonsillar abscess. That is a rare complication of diphtheria, as you seldom find it in a diphtheritic throat. I took a chance on the first 20,000 and the next morning, feeling that I had possibly not given enough, I gave 10,000 more. I believe, though, that the 20,000 would have accomplished all that was accomplished.

Regarding the question as to whether the gangrene resulted from a disturbance of the circulatory system or nervous system, my belief is that degeneration of the myocardium with a slowing down of the circulation to 50 for a long period of time was largely responsible for the thrombosis. The formation of the embolus and a deposit of two emboli at the same locality in both legs in the popliteal arteries strengthens this view. The emboli shut off circulation in the leg and developed the gangrene.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

FRACTURES OF THE NECK OF THE FEMUR*

By Duncan Eve, Sr., M.D.,
Nashville, Tenn.

If we agree with Stokes in his classification of fractures of the neck of the femur, viz., intra- and extra-capsular, the last named is subdivided into no less than six varieties, in two of which the line or lines of fracture run into the capsule. Even in the intra-capsular the line or lines of fracture sometimes extend outside the capsule, thus frequently making the differentiation quite difficult, but ordinarily it makes little concern, except in prognosis, for as a general proposition the modern treatment is the same for both intra- and extra-capsular, except in a very limited number of cases.

In treating a very feeble old person for a so-called intra-capsular (small portion of the neck) fracture, it is best to make no attempt to obtain union, but instead to use measures to keep the patient alive as long as possible by placing her (for it is usually an old woman) in a comfortable bed for ten days to two weeks, using a Buck's extension to prevent muscular contractions of the limb, and sand-bags or a Hamilton's splint to prevent "helpless eversion." A small pillow placed under the knee to partially flex the thigh and leg and to relax these powerful muscles, will also be of advantage. Do not employ more than five to seven pounds of weight for extension. When pain and muscular spasms are relieved, or nearly relieved, it is well to get the patient out of bed into a reclining chair, and if possible permit her to get about on crutches. If hypostatic congestion of the lungs sets in; if signs of great exhaustion appear; if the appetite is affected or diarrhea occurs, abandon all attempts at treating the fracture and get the patient out where there is sunshine and fresh air. A good nurse will, by use of an alcoholic-alum solution, prevent bed sores for the first two weeks.

In the vast majority of cases, no matter how old the patient may be, if she is not too feeble, or if waste and degeneration are not disproportionate to nutrition and repair, undertake treatment. You may be forced to abandon it.

If it is decided to treat the case, place the patient on a hair mattress, or arrange an ordinary one by placing several blankets over it, and, if needed, several thin boards laid transverely under the mattress to prevent unevenness and the formation of hollows. It has been my misfortune to see several cases of fracture of the neck of the femur in which the results were anything but satisfactory on account of the fact that a proper smooth plane for their treatment was not arranged. A fracture bed is a valuable adjunct, for with a Balkan frame the bed-pan can be used, or the bed can be smoothed and the patient can be lifted or turned on her side without disturbing the fracture.

We have not time to consider in detail the various plans of treatment employed for neck fractures, for many good surgeons are not agreed as to the best. We might state as a fact that nearly all are satisfactory and have for their purpose the same object, as the World War demonstrated beyond question. Fixation and traction are the essentials. The extension should be gentle, never forcible. We hold that this can be accomplished by a Thomas' splint; a Blake's splint; a Jones' extension frame; a Buck's apparatus (sometimes combined with a Liston's splint); a McIntyre double inclined plane; a Hodgen's apparatus and finally, Whitman's plan of abduction of the limb in usually a plaster of Paris encasement.

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Personally, I prefer the last two plans, either alone or combined. I use the Hodgen's splint, or rather Dr. George S. Brown's modification of it, with the limb in Whitman's abducted position, especially if it is an intra-capsular in rather an old woman. On the other hand, if I have an impacted extra-capsular (base of neck) fracture, especially in a strong young subject in which I must pull apart the impaction by forcible abduction, I would follow the plan advised by Whitman by making extension and fixation by use of a plaster of Paris cast, placing the limb in the position of full abduction, for we then need the strongest plan of immobilization.

The plan of treatment advocated by Royal Whitman is ideal, for it aims to abolish traumatic depression of the neck of the femur. Therefore is applicable to both intra- and extra-capsular fractures of the neck of the femur.

Dr. R. T. Pirtle, of Louisville, Ky., in the *American Journal of Surgery*, May, 1921, sums up the advantages of the Whitman method as follows: (1) there is little or no shortening; (2) little or no pain; and (3) good function is secured.

In intra-capsular fracture, especially in old persons, we never pull apart an impaction and use the Brown's modification of Hodgen's apparatus with the limb in abduction.

Whitman claims the limb is not only shortened, but somewhat flexed, rotated outward and usually slightly abducted. The outer fragment (that is the lower fragment) is turned forward and upward and is usually on a lower plane than the head. One cannot control the inner fragment, so the outer fragment must be carried to the inner.

"The patient is anesthetized, placed upon a sacral support, the shoulders are to be rested on a box of equal height and the lower limbs are to be extended and supported. The assistant abducts the sound limb to the anatomical limit. The degree depends upon the age and individual limitation. It is usually 40 to 50 degrees. This gives us a gauge on the proper position in which to place the other hip. The surgeon flexes the thigh of the injured side and thus separates the fragments. The shortening is abolished by the manual extension of an assistant. He then performs inward rotation and abduction to the proper degree. The abduction relaxes the muscles, which interfere with reduction and carries the outer fragment against the inner."

The extremity is set in extension and extreme abduction. The tension of the capsule pushes the outer fragment against the inner and holds it. Fixation is obtained by the neck of the femur's being in contact with the acetabulum and the great trochanter with the pelvis. Deformity cannot be caused by muscular action, for the psoas helps pull the fragments together (Whitman).

The limb is usually kept fixed in abduction by a plaster of Paris cast or Brown's modification of Hodgen's splint for six to eight weeks, when a Thomas splint is applied and the patient is allowed to use crutches for at least two weeks longer before any weight is allowed to be placed on the limb. A patient with a fractured femur should be hospitalized.

Operative treatment of fractures of the femoral neck is not very popular and should be undertaken only in young and middle aged persons, in whom retention in correct position seems impossible. McGlannon sets forth the following contra-indications:

"Dilated heart, intermittent pulse, irregular pulse, very high blood pressure, pulmonary congestion, marked renal insufficiency, evidence of a nervous breakdown, signs of uremia, alcoholism or a drug habit."

If an open operation is decided upon, make a fluoroscopic examination to determine that extension and abduction have succeeded in bringing the fragments in apposition, when a small incision is made through the skin over the external aspect of the great trochanter and usually an eight or ten penny finishing (nickel plated or silver) nail, previously selected, is driven through the trochanter and neck into the head for fixation. A plaster of paris cast is applied, with a trap door cut out over the site of the incision. An ivory peg instead of a nail may be used, in which case the trochanter and neck are drilled before the peg is placed.

In ununited fractures of the neck of the femur autogenous bone grafts promise the best results if the patient is physically able to undergo the operative procedure and subsequent confinement. The operation should never be made upon a very old person.

Discussion follows paper of Dr. Baker, page 614.

THE GENERAL TREATMENT OF FRACTURES, WITH SPECIAL REFERENCE TO FRACTURE OF THE FEMUR*

By Edward T. Newell, M.D.,
Chattanooga, Tenn.

The consideration of fractures is always an interesting subject to the railway surgeon. They make up a large part of his work in this special line of endeavor and carry with them his greatest responsibility, both to the patient and the railroad.

The treatment of fractures should begin as soon as the emergency is brought to you, or as soon as you reach it. A brief history of the case should first be obtained, if possible, for this will lead to a more accurate diagnosis of the fracture and of the probable extent of the injury.

If the fracture is a perfectly plain and frank one, temporary splints should be applied for immobilization, to lessen pain, shock and damage to the soft parts. This is done before the more radical procedure of setting the fracture is attempted.

Unless the fracture is of one of the small bones or there is some contra-indication it is well in every case to give a hypodermic of morphin and atropin as a preliminary to the setting of the fracture, the dose depending upon the individual and the amount of trauma and shock. This will relieve the pain and shock and better prepare the patient for the general anesthetic, which should be administered in practically every case before an attempt at reduction is made.

No matter how certain you are of the diagnosis of a fracture, or the character of it, an x-ray should be taken before any attempt at reduction is made wherever this is possible.

In our clinic, during the past ten years, we have found that at least 10 per cent of fractures diagnosed by x-ray examination from all the clinical evidence could not have been diagnosed. These cases, if improperly diagnosed and improperly treated, would have later revealed themselves in deformity, callus formation, pain, and in a certain definite number of patients would have produced permanent disability.

In railway, corporation and compensation cases where the hands and feet have been severely traumatized by great force or by coming in contact with heavy objects, the prognosis as to recovery and time of disability depends largely upon whether the injury affects only the soft parts or the bony structures as well. Here again the radiogram, in giving an accurate diagnosis of the condition of the deeper structures, whether a transverse, a linear, an oblique fracture or a fragment of bone is broken off, is the most reliable diagnostic and prognostic aid to the treatment.

When a patient is brought to you with such a history he is desirous to know whether he has a broken bone, and it is only justice to him and to the company that he works for, and that you represent, to ascertain the true condition. If he is x-rayed and found "negative for fracture," he is usually satisfied, and as soon as the swelling and pain leave the parts he is ready and willing to report for duty. A negative x-ray in such cases not only has great value from a diagnostic standpoint, but is of equal value in satisfying the patient that he is not seriously hurt, and may later prevent litigation. Should litigation develop the negative x-rays are of greatest value in the trial of the case. They should be taken whereever there is a reasonable probability of fracture.

Our custom in the use of the x-ray in fracture work is to ray the supposed fracture for a diagnosis. If a fracture is found, we set the fracture under the fluoroscope and then x-ray it after the dressings have been applied, usually before the patient comes from under the anesthetic. Thus we have a double check on our work. We are able by the fluoroscope to be practically certain at the time of the setting that we have the bones in accurate approximation and alignment. This is especially the case in fractures of

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the small bones, upper extremity and legs, but the fluoroscopic findings are not so definite in fractures of the thigh in stout, robust individuals where the muscles and tissues are thick and dense. We have been checking our fluoroscopic findings with our radiograms taken later and find them over 90 per cent correct. Necessarily, we find it often impossible to obtain and maintain 100 per cent approximation of bones and fragments in all cases, and this is especially so where more than one bone is broken. However, we satisfy ourselves at the time of the operation that we have the fragments in the best possible approximation and alignment and at least know at the time what we have done and what to expect later. All of you know that it is not necessary to have a 100 per cent approximation to get a good functional and cosmetic result.

Where the fracture is put up in a permanent dressing, splints or casts, we think the x-ray taken immediately after the approximation is done is all sufficient, unless at some later inspection the alignment or conformation of the limb is not satisfactory. If you have used a Thomas' splint or other extension splints or apparatus, x-rays should be taken at the end of seven or eight days following the application of the splints and again at the end of three or four weeks. The reason for these additional radiograms is obvious to all of you. These splints require constant inspection and attention and frequently slight changes must be made. As the fragments are held in position chiefly by traction (often pulled in place by it), slight changes in the pull and pressure from any one of four angles may decidedly change the position of the bones in the deeper parts, yet you may not be able to see what is taking place from the surface. It is necessary, therefore, that these fractures be checked frequently by x-ray examination.

When you have placed a fracture in a board, composition or plaster splint you can, provided the dressing is well padded and not too tightly applied, let it alone for an indefinite time. When you use the Thomas, the Jones, or the Hodgen splint, the first application of the splint is only the beginning of the treatment. You should daily inspect the limb and when necessary make such slight changes as are indicated. This calls for well trained assistants, and the patient is better cared for if placed in a hospital. The results obtained are much more satisfactory and the comfort of the patient much greater.

External splints and traction in the treatment of fractures should be used in the majority of cases.

Not infrequently in oblique, comminuted and compound fractures with more or less bone destruction, fractures in and around joints, fractures of the superior and inferior maxilla, it is necessary to use internal splints or other methods. Various materials and numerous methods have been devised to fulfill these requirements. Lane plates, Parham-Martin bands, bronze, copper and silver wire, kangaroo tendons, heavy chromic catgut, beef bone plates and autogenous bone grafts, all have their exponents. I do not approve of the use of the first (Lane plates). I believe that all hardware should be discarded if possible in bone surgery, and where necessary and feasible, the bone graft should have preference over all other internal splints. Hardware when used in bone surgery will sooner or later produce varying degrees of osteoporosis and lessen osteogenesis. Later it will act as a foreign body and will have to be removed. I am aware that there are some exceptions to this statement, but there are very few in the writer's experience. Of suture material, heavy 40-day chromic catgut, single or doubled, and kangaroo tendons have been found to give the best results where there is not much strain or tension to be put on the fracture line.

In doing a bone graft, most surgeons prefer the sliding graft, held in place with kangaroo tendons or chromic catgut. However, a few of the best men in this line favor the intramedullary splint. To be successful, bone grafting, regardless of the method used, should only be attempted by surgeons skilled in this particular line of surgery. Before attempting the operation the patient should have several days of preliminary preparation and the field of operation should have special

attention during this time. Operations of this kind should only be done in a hospital where the asepsis of the operating room is known to be as near perfect as can be attained. The assistants of the operator should be trained in this work.

The most useful field for this work is in cases of non-union where the ordinary methods to prevent it and correct it have failed. All such cases should have a negative blood Wassermann before any operative interference is attempted. (Delbet method.)

Time does not permit me to go into detail in the discussion of the treatment of the more important and common fractures that we see in our daily practice. I shall discuss briefly only the treatment of one of the most difficult fractures, fracture of the femur, and shall stress a few points in regard to fracture of the neck as well as fracture of the shaft.

On account of the thickness of the structures surrounding the neck and upper two thirds of the femur, the diagnosis of the nature and extent of these fractures, as well as the proper coaptation of the fragments is exceedingly difficult. The classical signs of fracture of this bone are so well known to you that I shall not burden you by detailing them at this time.

We shall assume that a diagnosis has been made of fracture of the neck of the femur in a patient, age 70, with poor resistance. After the recovery from the shock of the accident, the appropriate treatment of this case should be the application of a Thomas splint suspended from a Balkan frame with traction. The amount of the weight used would depend upon the extent of the deformity and the muscle tone of the patient. The splint should be angulated slightly to flex the knee and the extremity widely abducted. The abduction presses the distal fragments against the short proximal fragments and the flexion at the knee relaxes the muscles and permits the distal fragments to be pulled down and the bones approximated.

The use of this splint permits the extremity to be readily inspected, the leg to be massaged, the patella and ankle to be mobilized and passive motion of the knee to be begun early, thereby preventing stiffness of this joint. The traction weights are usually reduced in ten days and removed in four to five weeks. The splint can usually be removed in seven to ten weeks. The leg is then simply elevated in the bed by placing pillows under it.

At the end of another week the patient is allowed to use crutches and to begin to bear some weight on the limb, the amount depending upon the extent of union that has been secured. Some few cases can get around with a cane in two months, others only after four or five months.

If you are dealing with a case that is impacted, do not disturb the impaction. You will have in nearly every case of impaction some external rotation and eversion of the foot, but your patient's chances of recovery, provided you do not disturb the impaction, are far better, and the slight deformity at this age is not of very great importance. The further treatment of the impacted cases is quite similar to the unimpacted, only you do not apply as much traction to the limb and they are usually allowed to get about sooner.

In fracture below the trochanters (shafts) in robust, healthy adults and in children, the treatment is similar to that outlined above. In the shaft fractures, as you will see from the slides to be presented later, there is frequently much more shortening; the upper fragment is usually pulled forward by the iliopsoas, and out by the glutii and external rotators, while the lower (distal) fragment is pulled up and in by the powerful abductors and quadriceps and hamstring muscles. The shortening and disalignment requires a slight modification of the technic outlined above in the fractured hip cases. In adults, fifteen to twenty-five pounds traction is applied to the limb during the first ten days. It is important to apply the greatest pull at the beginning of the treatment and in this way overcome the shortening early. The external deviation of the proximal fragments can be overcome by a gauze pack inserted between the outer side of the splint and the limb at this point. The internal de-

viation of the distal fragments is overcome by packing between the inside of the splint and the limb at this point, and the backward displacement of the distal fragment, if present, is corrected by a cotton pack in the bed of the splint behind the leg of the lower fragment. A very splendid modification of the Thomas splint by Dr. Bradburn, of New Orleans, has screw devices to correct these conditions, but if you have a well-fitting splint you can correct the deformity by the methods described above. The ankle should be well padded lest you have pressure resulting in pain and excoriation of the skin. The leg should be shaven before the adhesive is applied for traction, and only moleskin adhesive should be used. This should come high up on the thigh in all cases and should be split and wound around the extremity in such fashion that the pull is uniformly distributed to the skin of the entire leg and thigh. It is surprising how long adhesive will stay on if applied in this manner, be effective, and not cause discomfort.

By checking with the x-ray from time to time you can tell just where to make pressure, whether more or less traction is required and you also know when sufficient callus formation has taken place to remove the splint.

It is well when the use of crutches is begun to put the weight on the leg very gradually lest the soft callus formed should give way (bend) and you get the characteristic outward bowing of the limb with shortening and deformity, an unfortunate result in an otherwise well treated case.

The primary mortality in fracture of the hip in the aged has been, and always will be, too high, but the mortality in the future in those who survive the first few weeks will be greatly lowered by this and other of the newer methods of treatment. The morbidity in the aged was until recent years excessively high. By this method of treatment the morbidity has been greatly decreased in aged patients.

In children and young adults the mortality should be practically nil and the morbidity reduced to 10 per cent or less.

The ideas presented in this paper are gathered from our experiences with a large number of fracture cases treated in our emergency department in the past fifteen years. We realize that there are many other satisfactory methods of handling and treating fractures and that a surgeon should fit the special operation or method of treatment or appliance to the case rather than the case to his method. From observation of the work of other men, their methods, their successes and their failures in this particular line of work, and from our experiences with many different methods of treatment, I am convinced that the Thomas splint with the addition of the Balkan frame, aided, checked and controlled by radiographic and fluoroscopic examinations, at the time of the fracture and during the convalescence of the patient, offers the most satisfactory and comforting form of treatment both to the patient and the doctor.

Discussion follows paper of Dr. Baker, page 614.

TREATMENT OF FRACTURES OF THE UPPER END OF THE HUMERUS*

By J. N. Baker, B.A., M.D., F.A.C.S., Montgomery, Ala.

Traditions die hard. More especially is this true when they have descended to us not from one, but from several generations of our forefathers. The recent World War shattered many things—material, idealistic, and traditional. Of the many severe jolts administered by this cataclysm to the medical profession, none has been so far-reaching or beneficent as that dealt to our inherited conception of the proper method of dealing with joint fractures and joint injuries.

It would seem that nothing short of such an upheaval, furnishing as it did, clinical material in endless numbers, manipulated and directed by such clear thinking, logical minds as Willems, Blake and Sir Robert Jones, could sever the forged chains which bound the profession to the age-old policy of locking up these joint injuries

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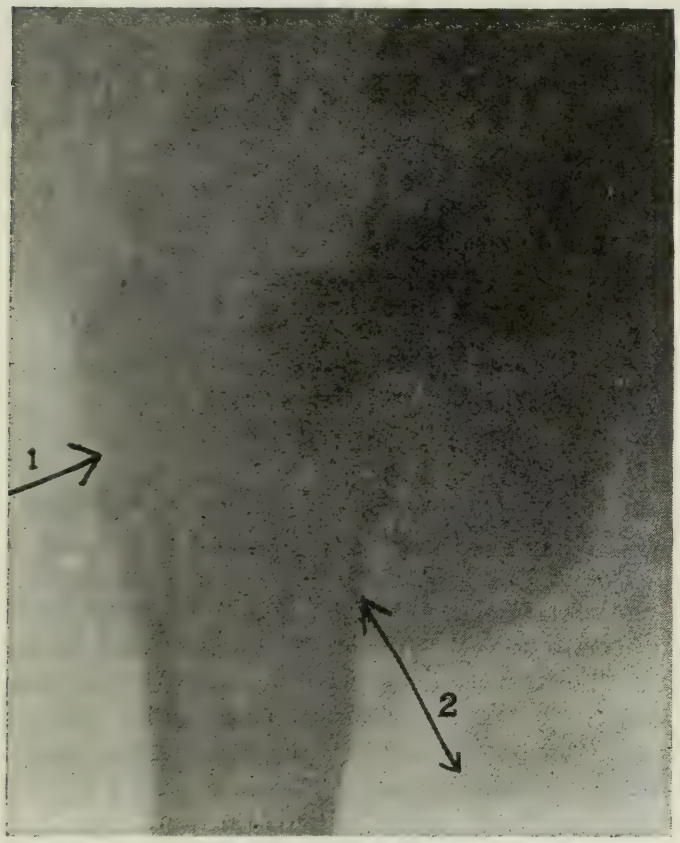
for an almost interminable length of time. At last, however, the scales have fallen, the chains have been loosed, and today joint fractures are viewed, primarily, not as severed bones, but rather in the light of severe traumatisms inflicted upon the soft tissues about the joints.

With this brief prelude, let us approach the subject of the treatment of fractures of the upper end of the humerus.

A cursory consideration of the anatomy of the parts is imperative for an intelligent application of treatment.

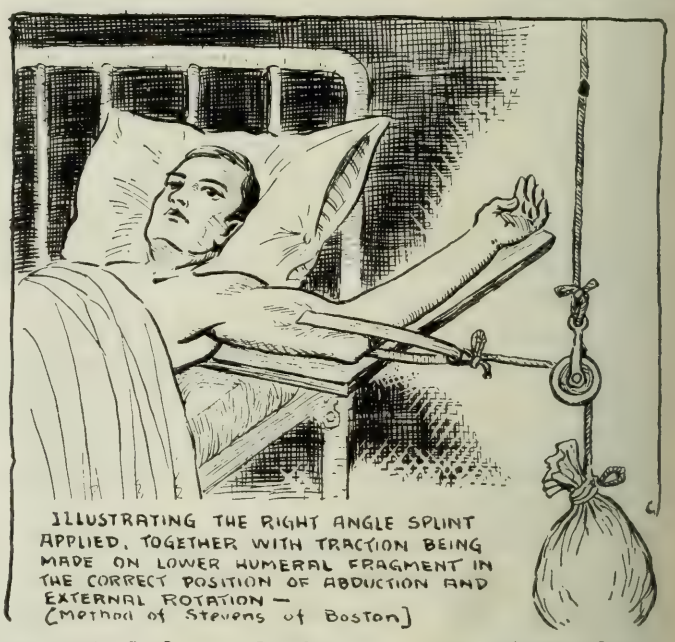


1. Tearing up of outer tuberosity.
2. Fracture through anatomical neck with considerable impaction.

Treated by abduction and extension on simple right angle splint for 12 days; then all splints removed, arm brought to side, supported by sling and active and passive motion begun at once. At end of five weeks, function is quite satisfactory.

The ligaments—capsular, coraco-humeral and glenoid—in any consideration of upper joint humeral fractures are negligible, for the reason that the muscles of the shoulder girdle are the real factors in securing the joint. Likewise, when severance of the bone takes place, they are the factors with which to be reckoned in the application of logical treatment. If the two fragments are permitted to unite at an angle, and this is of vastly more importance, with a marked rotational discrepancy, a poor functional result is sure to ensue. Or, to borrow the terse description of Sir Robert Jones, the resulting limb will work about as well as a pair of wheels with a twisted axle. If the axle be straight the wheels will go round true, regardless of the amount of patch work on the axle.

For pedagogic purposes, the traditional and classic subdivision of these fractures into intra- and extra-capsular, into fractures of the anatomical or surgical neck and of the outer tuberosity, may be serviceable. But from the viewpoint of rational therapy, such befogging classifications are quite superfluous. The problem


ILLUSTRATING THE RIGHT ANGLE SPLINT APPLIED, TOGETHER WITH TRACTION BEING MADE ON LOWER HUMERAL FRAGMENT IN THE CORRECT POSITION OF ABDUCTION AND EXTERNAL ROTATION — (Method of Stevens of Boston)

presented for solution in any given fracture of the upper end of the humerus is quite the same and the results will be good or bad largely in proportion as recognition is given to a proper consideration of the muscular forces at play upon the severed fragments and of the traumatized joint structures. They all present the common picture of a joint severely contused, plus the severed bone. Should the bony displacement be trivial, concern for the joint injury should be uppermost.

What are the muscular forces hovering about this joint and what the resultant of these forces when applied to the severed ends of the humerus?

Attached around the head are the subscapularis, the supraspinatus, the infraspinatus and the teres minor, the combined force of which when applied to the upper

segment of a complete humeral fracture is to abduct and externally rotate. Converging on the region of the bicipital groove and ridges we have the latissimus dorsi, teres major and pectoralis major, the combined force of which, when applied to the lower segment, is to adduct and inwardly rotate. These taut adductors can be distinctly palpated in the axilla after every injury to the shoulder joint.

The surgeon's problem, therefore, is twofold: first, to neutralize effectually the distorting cross tension of these muscles and thus rob them of this most vicious tendency; and secondly, so to align the lower fragment to the upper, uncontrollable fragment as to nullify rotational discrepancy.

The tethering tactics employed by our ancestors of naively locking up the shoulder joint with an elaborately moulded plaster cap and of binding the arm to the thorax did neither of these very important things. On the contrary, such practice materially contributed to both ankylosis and dysfunction. Hence it was that not infrequently those shoulders which had received a severe trauma and a fracture, but which had escaped the pangs of an exact surgical diagnosis, functioned far better in after life than did those which had been so long incased in plaster with such meticulous care.

In none of the text books available to the average surgeon and published prior to the World War are these fundamentals sufficiently stressed. Nor does the treatment recommended by these authors indicate a full appreciation, on their part, of the necessity of completely subduing the muscular forces at play.

No ambulant splint with which I am familiar satisfactorily solves the problem of overcoming both the adduction and the external rotation. The old triangular axillary splint of Middeldorf secures neither full abduction nor corrects the internal rotation. The metal abduction splint and its various modifications procure the abduction, but with the forearm forward, as is the case with all of them, the internal rotation remains uncorrected. The only means whereby both the external rotation and abduction of the upper fragment and the internal rotation and the adduction of the lower fragment can be overcome, as well as the proper production of a nullification of the vicious muscular forces, is to place the patient in bed. One hesitates, probably because of inherited tradition, to enforce a brief confinement upon a patient suffering with a humeral fracture, when if confronted by a similar fracture of the lower extremity, one would unhesitatingly insist upon a prolonged siege in bed. The surgeon must ever bear in mind, when dealing with fractures, that the goal to be assiduously striven for is a satisfactory restoration of function if he is to escape the uncurbed invectives of a dissatisfied patient. And consequently any temporary hardships inflicted upon the patient should weigh but lightly.

The treatment which has been found most satisfactory in my hands and which seems to lend itself best to the thwarting of the mischievous muscular forces so dominant in these fractures is the one outlined by Stevens, of Boston, several years ago in the *Annals of Surgery*. It is simple; it is logical; and it is effective.

The first step always in the case of any shoulder upon which even the suspicion of a fracture rests is the procuring of an x-ray; this should be stereoscopic if one wishes to be able clearly to define the rotational discrepancies likely to be present in the fragments. The ordinary x-ray plate will not do this. Should a fracture be demonstrated, whether it be of the greater tuberosity, of the anatomical or of the surgical neck, the patient should be placed in bed on a firm mattress. General anesthesia is usually not necessary for such manipulations as may be needed properly to align the fragments. It must constantly be borne in mind, however, that the upper fragment is the unruly one, and that all our energies are to be expended in forcing the lower one to adjust itself to the whims of its more exacting companion; that is to say, traction must be made in the axis of the humerus with gradual abduction so that the arm is perpendicular to the body and the forearm at right angles to the arm. The limb is then rotated externally until the entire arm rests evenly upon the bed, the hand lying beside the head with the palmar surface looking upward. Strips of adhe-

sive plaster are then applied to the lateral aspects of the arm for its entire length, being attached beyond the elbow to a spreader, after the fashion of the Buck apparatus employed for extension of lower limb fractures. A simple right angle splint well padded and of some three or four inches width is now slipped under the injured limb, thereby furnishing a firm, yet comfortable support. The inner end of the splint should extend quite to the midline of the body posteriorly. A roller bandage snugly, though not tightly, applied from the wrist to the shoulder serves to anchor the forearm and the arm to the splint. The hand is left free so that the fingers may be worked at will. Traction is applied to the humerus by means of a pulley and weight attached to the side of the bed. The amount of traction will vary somewhat according to the muscular forces to be overcome, but in every case it should be ample, at least eight or ten pounds, until relaxation and spasm are mastered. The shoulder joint itself is left free so that gentle massage and hot fomentations may be used, both of which agencies hasten absorption and minimize pain. Elevation of the bed on the injured side will add to the efficiency of the extension by providing counter-extension from the body.

How long should extension in this position be persisted in? For the milder cases, that is, those presenting but trivial bony deformity, Stevens recommends from three to six days. For the more severe forms, from seven to twelve days, never longer. Schubert, of Berlin, utilizes the same position of abduction and extension for three weeks with daily active and passive motions of the elbow and rotation of the shoulder from the beginning.

In my own work I have followed closely the teaching of Stevens, removing all splints and extension in from five to twelve days, placing the arm at the side with the forearm supported by a sling and at once beginning passive and active motion, with frequent massage.

The after-care of these cases is of superlative importance if the maximum yield in function is to be had. The surgeon himself must control and direct its every detail because of the unwillingness, frequently, on the part of these patients to submit to the discomforts attendant upon the passive motion so necessary to bring about a serviceable arm.

The accompanying photograph and x-ray (page 612) of a case recently handled in this manner and with quite a satisfactory result are self-explanatory and will elucidate the text.

DISCUSSION—SYMPOSIUM ON FRACTURES

Papers of Drs. Eve, Newell and Baker.

Dr. J. M. Burke, Petersburg, Va.—Fractures, from the railroad standpoint, cause the roads to pay out much money. In private work we are satisfied with a good functional result even if the bone is not in good alignment, but in railroad work the opposite obtains. Some men will go on the stand and say that the patient has imperfect alignment but good functional result, but there may be some osteomyelitis and other far-fetched conditions that may give rise to trouble in fifty or a hundred years thereafter, and the railroad pays the bill before juries for such obscure opinions.

The x-ray examination has been of great help, but the fact remains that more pictures are taken than should be, not by the railroads but by industrial and other corporations. It has created in the mind of the individual the thought that there should be an x-ray picture whether you think there is a fracture or not. If a physician says there is no need of an x-ray picture that should be the end of it. Another physician, if he is employed by the railroad, may say: "You should have an x-ray picture taken. Don't pay any attention to that fellow, for he is working for the railroad or the corporation. He may be the best orthopedist in the world, but they do not take his word for it." We are all troubled with such people as those. We must ask the patient if he is perfectly satisfied. If he is, tell him: "You do not need an x-ray picture. If one is required we will take it later."

The man may have a fracture which you well know and the callus may be thrown out sufficiently well to be felt without the aid of the x-ray. He has a good result, is able to play baseball or football or do anything else he wishes and you feel well satisfied that you have gotten a good result. He goes to some outside physician who says: "Yes, there is a good functional result, but there may be trouble in fifty years on account of the slight change of alignment."

I have found in fractures years ago that hypodermics and morphin were of great value. They should be given to lessen the pain and shock. Have the x-ray diagnosis when required. Then, as I have stated, insofar as the treatment is concerned, every case is a law unto itself. A good carpenter would make a good bone setter and any one can get a fairly good alignment in the ma-

jority of cases. One thing that is of great assistance is the use of the Hawley table, especially in fractures of the head of the femur.

Dr. Archibald E. Chace, Texarkana, Ark.—After using all means at my disposal there still remains a certain percentage of cases in fracture of the long bones which I cannot get into good position. I have devised a little instrument that has been of help to me. Suppose we have a fracture with considerable overriding. Take, for instance, the tibia. We have four definite things to overcome. First, a certain amount of rotation, and to do that we must apply pins in such a way as to overcome the rotation after it has been corrected. The pins are firmly fitted into a clamp and these clamps into a mechanism by which any slight deformity is overcome in the three other directions of displacement. The device is then locked and the patient left in that position until the callus is firm. Then the pins are removed and there is no hardware left in the patient.

Dr. Hermann B. Gessner, New Orleans, La.—I should like to discuss this subject particularly from the point of view of the application of the Parham-Martin band. The Parham-Martin band is a flat band which is brought around the two fragments. Then the smaller end is brought into the larger, bent back on itself, and the excess cut away. I have had experience with this in six cases, five in the femur and one in the humerus. The band is particularly applicable to those two bones. In these cases there was no infection. The band can be applied with the Lane technic. We can bend it over with instruments and cut off the excess.

In the cases I refer to there was hematoma in one case only. In four fractures of the femur it was very satisfactory. In one of the femur the result is doubtful. This occurred in an old man who was carrying water and suddenly tipped over and found his femur broken. This suggested pathology, but at operation no disease was found. His femur was banded and he was sent home in a cast and came back some time afterward with a partial union only. After this second time I lost track of him. I shall place this among the doubtful cases, although he may have had a good result ultimately.

The advantage of the Parham-Martin band is the small degree of trauma to the marrow. There is no occasion for driving in screws or nails.

I had the interesting experience of removing a band after six weeks and seeing the condition which then existed. I took off the band because I had read in a paper on the subject that there is danger of injuring the bone in young patients by preventing growth in thickness, and with this fear in mind I took off the band and saw a sight that was of interest from the physiological point of view. It was a case of spiral fracture in which I had obtained a very exact apposition and complete immobilization. When I took off the band it looked as if these two pieces of bone had been cemented together with liquid glue. There was no callus visible. It was like the union of soft parts without any visible granulation tissue.

It is interesting that in some cases it is necessary to use two bands, in very oblique fractures. I wish to commend this method of treatment particularly to those who have oblique fractures of the femur or of the humerus.

It is difficult to tell in which cases x-ray pictures may be omitted and in which they should be taken. I speak with feeling because I have just been caught. Some months ago I saw a lady who had tripped on a wire and injured her elbow. She came to me within an hour of the accident. I palpated and assured her that she had no fracture and told her to go on using the arm. A few days afterward she returned, saying that she had severe pain. I then had a picture taken and found a fracture of the olecranon. It is wise to have pictures taken in all cases of severe contusion.

With regard to fracture of the neck of the femur I have had satisfactory results with the Whitman mode of treatment. I think the thing I get into trouble with most is incomplete correction of the rotation. In the case of a young woman who had an ununited fracture after ten months I got a good result following the use of a tibial graft for pegging. Some writers, like Davison, think it is necessary to take the lower end of the fibula for this purpose. They believe the proper amount of support can be obtained only by means of a large piece of bone like that. I have had only a limited experience, but it seems to me it is unnecessary to mutilate a patient in that way.

There is one mode of treatment I did not hear mentioned and that is the Maxwell-Ruth treatment of femoral neck fractures. I know this method has been used with good results by Dr. Urban Maes.

An article I read recently was of great interest, one proposing the grading of fractures, the three items being reduction, union and function. The writer gives 100 per cent maximum on each of the three. If he has a good reduction he puts down whatever percentage he is entitled to for this. At this time for union there is 0 percentage and for function 0 percentage. At subsequent examinations he regrades his cases on reduction, union and function. It seems to me that those of us who have to make reports on fractures may find this method useful.

Dr. Wm. P. Bradburn, New Orleans, La.—I would like to describe the treatment recently adopted by Dr. Martin in the treatment of fractures. Instead of using the Whitman cast or the one screw, as suggested by Dr. Eve, Dr. Martin has used two screws, the one being insufficient to immobilize the hip.

The case which I shall show was one which Dr. Martin had with Dr. King, of New Orleans. The patient fractured her hip on May 11 and eleven days later was operated upon. There is one difficulty about employing this method and that is the proper application of the screws. We have tried to do this under the fluoroscope, but in one instance could not get the patient to the

operating room. This patient, six months after the injury, is walking around without any support. It is the practice to put these patients in extension until union is accomplished. We do not like to have any weight bearing on any of our fractures of the femur under six months.

We have employed the method of traction. However, in femur fractures we move the knee twice a day from the time the limb is put up, and at the time of discharge the patient has motion. At three and a half months there is 100 per cent mobility in a large majority of the cases. The two main difficulties in femur fractures are impaired mobility and shortening, but the shortening can be overcome in practically every case by skeletal traction.

In reference to the Lane plate, I shall take exception to what Dr. Newell stated. It has been my practice to use the Lane plate in compound fractures. If I get a fracture before infection occurs I apply the Lane plate after a complete debridement. If I get the leg in the period of infection, then I employ skeletal traction, placing the tongs in the maleoli in case of leg fractures. I believe twenty pounds is the safest weight with which to start treating a fracture of the femur. In a fracture of the femur in a child we have little difficulty with impairment of knee function. After the age of fourteen the difficulty begins and you are likely to have some trouble unless you employ skeletal traction, using the Williams-Thomas splint, whereby passive motion can be carried out from the day the limb is suspended.

Dr. James R. Garner, Atlanta, Ga.—I think many mistakes have been made and charged up to the Lane plate that were not due to the Lane plate, but to the technic in the application of the plate. If a Lane plate is put in place with ordinary wood screws they will slip and leave a loose plate, which is a foreign body and will give trouble and have to be removed. If it is applied with a Sherman tap screw it will remain in place and not act as an irritating foreign body. The Lane plate is frequently applied to the bone and fastened directly over the periosteum and you can expect only one result, which is necrosis of the periosteum with sinus formation and removal of the plate. I have been using Lane plates, not exclusively, because we must have a rule for each case. I have used it for fifteen years in over a hundred and eighty cases and have had to take out only two. I prefer the Sherman modification because it is thinner, curved, is better able to adapt itself to the curve of the bone, and can be applied with greater ease.

No mention has been made of one of the most important facts in regard to the treatment of fractures, and that is the interposition of other tissues between the fractured ends of the bones. That is one thing we should look out for and the one thing that is the greatest cause of failure to obtain union. If you have a piece of muscle or fascia or anything else between the ends of the bones you will not obtain union until it is removed.

I agree with Dr. Burke that x-ray pictures are too frequently taken. On the other hand, physicians who take a picture before the work has been done, too frequently omit it after. The second picture should always be taken to show the results obtained, and this should be kept as a matter of record.

Dr. Wm. Beall Carroll, Dallas, Tex.—Very few fresh fractures in the long bones need open operation. Most of them can be reduced and kept in position with extension. We have had a fracture service of something like three hundred and fifty a year and during the last year we have operated less than 10 per cent. We have done more skeletal traction than ever before. We use a Pearson tong at the condyle and the fracture comes down.

I do not agree that every fracture is a law unto itself for a routine treatment is a good thing. If a patient is in the hospital the interne knows just what should be done. For a fracture of the femur the immediate application of the Thomas splint and the use of the Hawley table will reduce most of them. We use a splint that opens at the knee and gives motion at the knee and also traction at the foot of the bed. Most patients will complain of the perineal pressure unless there is additional traction over the foot of the bed.

Dr. Theodore Toepel, Atlanta, Ga.—On account of our neglect of fractures and sprains the irregular practitioners, such as the osteopaths and chiropractors, encroach upon work which rightly belongs to our profession. Our aim in treating fractures is to bring about a union between the broken parts and to have well functioning joints. It is our desire to return the patient to his daily work as soon as possible. The method of reduction employed depends on individual technic and personal dexterity. A method may be successful with one man and a complete failure with another on account of a different muscular and mental coordination. But on one point we must all be united. After having reduced the fracture properly, we must hasten the process of repair and prevent ankylosis. When we have reached this stage of the treatment of fractures there is no difference of methods of procedure, but it becomes our duty to apply passive exercise at first in the form of massage eight to ten days after reduction to encourage repair, and in from ten to fourteen days after reduction to resort to passive motion in the form of moving the parts involved to prevent the formation of callus in the joints, at first a very few degrees, increasing the radius of motion gradually so that within three or four weeks' time the natural motion is usually successfully accomplished, which is always followed by vigorous active exercise confined mainly to the parts involved. The patient in the majority of cases is ready to use the involved part as well as before the accident in from six to eight weeks. If all our fracture cases would resume their daily work four weeks earlier, a worthy economic contribution to society would be made by the profession.

Dr. W. W. Harper, Selma, Ala.—If I were chief surgeon of a railroad I would have at every point of that road an arrangement whereby x-ray work could be done and properly interpreted. It has been said that there are two kinds of liars, the ordinary liar and the x-ray. A crooked x-ray man can make a fracture look like anything and everything. I believe that no supposed fracture should be treated without an x-ray picture, and we certainly should have an x-ray picture after the fracture has been reduced. A man who will take a picture at the proper angle fortifies us as railroad men against lawsuit.

One fracture where the x-ray shows absolutely nothing is the epiphyseal fracture. In these cases the diagnosis must be made not with the x-ray. If you take a crowbar and lift up a big rock and then remove the crowbar the rock settles back and no one can tell it has been moved. The same thing happens with many epiphyseal fractures and no one can say there has been a fracture. There are three things upon which the diagnosis of epiphyseal fracture is made: first, loss of function; second, bone encircling tenderness; and third, consistent history. By the history I mean that the loss of function should be immediate and not come on several hours afterward. For instance, a child stumbles and falls, gets up and walks away. A few hours after this a surgeon is called because the child refuses to walk. With this history one is sure that there is no epiphyseal fracture, for had there been the child would not have been able to walk at all after the injury. The refusal to walk several hours afterward is due to the stiffness and tenderness of the soft parts. A child falls on its arm and immediately refuses to use this arm. Without any other symptoms one may feel sure there is an epiphyseal fracture if one is able to rule out a dislocation.

All fractures should be reduced under a general anesthetic. The question is, are you going to use ether or nitrous oxid? I do not believe you get enough muscle relaxation in the majority of cases with nitrous oxid. You can, however, do what they are now doing at the Massachusetts General Hospital. After giving the morphin they give an intramuscular injection of magnesium sulphate, I think about half an ounce of the 10 per cent solution. This gives you good muscle relaxation for several hours. In treating a fracture the surgeon must obtain not only good bony union, but there must be a good functional result.

In fractures near the elbow one may get a good bony union at the seat of fracture, but a poor functional result if the patient is unable to bend or flex the elbow. What can be more annoying to the surgeon than to have a fracture of the wrist united perfectly but the wrist in flexion? The man who will remember you the longest is the man with Potts' fracture who recovers with a valgus. He has a flat foot and pain in his knee all the time.

In fractures of the hip in people past 65 my rule is to treat the fracture as a simple contusion of the hip, order liniments, and the patient in a rolling chair. It was my good fortune to be at Johns Hopkins recently and see Dr. Baer's work. With reference to intracapsular fractures his rule is this: in patients under sixty to wait ten days after the injury, then pin the fracture by driving nails through the trochanter. In a patient over sixty years he does nothing. If he sees a patient months after the injury where nothing has been done he removes the head of the bone, which he claims is an atrophied ball rolling around the joint and acting as a foreign body, saws off the trochanter, splits the periosteum and makes a new bone head out of the end of the femur, places this new head in the acetabulum and puts the extremity in abduction.

Dr. E. Dunbar Newell, Chattanooga, Tenn.—The gentleman who said each fracture should be treated as a case unto itself is mistaken. We must have some general principles and we must not follow other men's teachings, but learn to think for ourselves. I heard Dr. Harvey Cushing say that he wished the Harvard graduates could be sent to the country to practice medicine for a year so that they would learn to think for themselves. I remember in London how enthusiastic every man was about plating every fracture. They began to open up all the cases and plate them. Shortly afterward I was attending this same Association meeting and a good man got up and said that he thought every fracture should be treated with a Lane plate. He was a good man, but he was carried away by Mr. Lane's work. That was the general principle that they attempted to force on the profession.

The most important thing is the diagnosis. It is absolutely essential to take an x-ray picture. We cannot make a diagnosis without it. It has been our custom to say that in every case where the blow has been sufficient to cause fracture an x-ray picture must be taken. This is not only for the protection of the patient, but for ourselves and in lawsuits. You must lay that down as your principle if you want to do your best for your corporation, that in every case where the blow has been sufficient to cause fracture an x-ray picture must be taken. In the treatment of fractures it is necessary to have some general principles. So many men go wild and forget the teachings we have had for so many years and are familiar with. The treatment of a fracture in the long bones with much contracture has been carried out by the Hawley table. With the addition of traction and the Thomas splint and the Balkan frame used intelligently, you can do away with even the thought of an open operation in 90 or 95 per cent of the cases. We have avoided the open operation as far as possible. Not carried away by the enthusiasm of Mr. Lane, we find that from month to month and year to year we get good results without an open operation. By the use of the Hawley table and the intelligent use of the Thomas splint we have less and less occasion to think about the open operation.

Not long ago at the Massachusetts General Hospital there was a symposium on fractures, and the men there have used the open operation

on only the exceptional cases. They have found, as so many others are finding, that with the use of the Hawley table, traction, and the Thomas splint, it is unnecessary to do the open operation. In the traction if we do not put the heavy weight at the beginning we make a great mistake. This must be used within the first few days. After that the heavy weight must be removed or there will be irreparable damage at the knee joint. If the correct weight is not put on at once so as to overcome the pull of the muscles we get bad results.

Another thing is the use of skeletal traction, but do not think you can use it in every case. We have seen some cases with bad results. Dr. Bradburn says 10 per cent. I think he has absolutely the ideal method for treating these cases. The hinge joint to the Thomas splint to drop it down and the skeletal traction is ideal, but do not try it unless you have seen someone else do it before you, for your patient will suffer severely. I have had this experience and have had to take it down.

In the treatment of fractures of the head of the femur our success has been very good. In the old people with the old Hodgins-Smith splint and now with the Thomas splint, propping the patients up in bed, our results have been excellent. We can show you splendid results in people over seventy who are walking around Chattanooga with a stick, and sometimes not even that. Our preference has been in these cases to use the Smith-Hodgins splint and prop them up in bed with a back rest and hygienic care. Our success has been so great that we think it is absurd not to treat them, but to leave them to Nature for the rest of their lives. Dr. Baer, I understand, does not treat these cases. If that is true I think he is wrong. We have all been doing that and we see them crippled all over the country. It would be absurd to follow Baer in such a teaching.

Dr. W. Barnett Owen, Louisville, Ky.—I am much surprised at the diversity of opinion in the treatment of fracture of the neck of the femur. If it is advisable to produce and maintain reduction in a patient of forty or under, it seems equally advisable to give a patient over that age the same chance of bony union. I can see no reason for treating patients of different ages in a different manner. If it has been proven conclusively, which I am firmly convinced, that the Whitman method of reduction and maintenance is proper; if this dressing has been applied properly under a general anesthetic preferably on a Hawley table, reduction and maintenance can be accomplished in practically every case. In the after-treatment an important point is the application of an overhead gas pipe frame fastened to the bed which can be used to suspend the affected limb in an upright position, making it possible to turn the patient on his unaffected side, back or face. Frequent shifting of position is necessary to prevent hypostatic pneumonia and keep up the patient's general strength. We had one patient, 106 years of age, at the Louisville City Hospital treated by Dr. Pirtle and myself, who made a good recovery after having been treated in the above manner. After the bone had united and she had been walking several months she died, having contracted pneumonia.

Referring to the point made about unnecessary x-ray pictures, I cannot at all agree. It is my personal feeling and practice to insist upon x-ray pictures before and after treatment in any fracture or suspected fracture, even in cases in which the usual signs of fracture are absent in which there has been trauma, and especially if there is a spot painful to pressure on the bone in this vicinity. X-ray pictures should always be made after reduction of a fracture. I have had some patients and doctors complain that the patient could not afford it. If that is true, I do not feel that the doctor can afford to treat the patient without having x-ray pictures, even though the doctor pay for them personally. I have, however, seen many cases in which, from an x-ray viewpoint, the fracture was not in very good position, but in which perfect function resulted, which is after all the essential point.

Dr. Eve (closing).—I wish to allude to a few of the points more especially brought out by Dr. Newell. I believe his position concerning an x-ray's being a necessity in nearly every case is correct. I never fail to issue a voucher to a surgeon for the use of an x-ray. Whether it seems necessary or not, I like to pay for them. I may think the x-ray men charge a little more than they should. In some cases I would rather pay for two. That reminds me of something that occurred quite recently, not in railroad but in private work. A mal-practice suit was brought against one of the best informed young doctors in our city for a fracture of the index finger of the right hand. I was called as one of the doctor's witnesses and insisted upon having a skiagram, which was negative as to a fracture or bone changes. The court ordered another skiagram, which agreed with the first. The lawyer who was representing the patient with the supposed fracture asked him to hold his finger up so that I might examine it. The finger was stiff. He apparently could not flex it, but unfortunately he held the thumb as stiff as the finger. I asked him what was the matter with his thumb, if it was also broken. He said "No." Then the lawyer asked me what I thought of it. I said, "I think he is a fraud." A day or two afterward one of the jurymen told me I had made the jury believe it was a fraud and the case was thrown out of court, as a result, we believe, of the two skiagrams. The doctor should never have been sued.

In another case a doctor was sued for a deformity which was supposed to be the result of a Colles fracture. When the case came to trial another skiagram was produced which showed a comminuted fracture about midway of the shaft. The Doctor said this was not the fracture he treated and produced the skiagram

of the Colles fracture he had treated. When the plaintiff showed his arm there was the result of great deformity due to fractures about midway of the shaft. When it seemed to be certain that judgment would be rendered against the Doctor, the Judge asked the plaintiff if he had any other fracture than this and the patient finally broke down and admitted that he had one of the wrist the doctor in question had treated. Suppose there had been no skiagrams in that case. The doctor would certainly have lost. I look at a skiagram as an architect would his drawing as containing the information necessary for a contractor to build a house. I agree with Dr. Newell that we should not only have skiagrams, but fluoroscopic examinations throughout the treatment of the case.

I am going to disagree with my friend, Dr. Newell, for if there is a fracture on earth that requires an open operation it is a fracture in the upper third of the femur. No Lane plate will do there. I have to dissent from my New Orleans and Atlanta friends.

Dr. Newell (closing).—There are many forms of treatment in these cases. The Whitman treatment is good and there are many cases where this treatment is applicable. The Martin band in oblique fractures may be used in certain cases and the Cole-Davidson method in children under ten years gives nearly 100 per cent results. Dr. Bradburn spoke of tongs and skeletal tractions. Dr. Bradburn has a splint which he devised. He has taken the Thomas splint, or a modification of it, and fitted it with supporting pads. In children this splint is not necessary, but in adults it has a place. If you have a well-fitting splint in children with fracture of the shaft this is all that is necessary, but it is very important to have it fit snugly. If you have only one or two splints to use in the treatment of all cases, from an infant to an adult, you will not get results, or at least not good results. The splint must fit the case. If you check your case with the x-ray and watch the extension as it progresses, making pressure where it is needed, watching with the x-ray or the fluoroscope (when callus formation is taking place you will have to do this repeatedly) you can see just what you are doing.

If you take a roentgenogram and go ahead blindly and set the fracture, you do not know whether you are shifting the bone too far up or too far down or too far in or too far out. But if you set it under the fluoroscope you know just what you are about. In fractured femur cases it is all-important to use the fluoroscope as a check. Then it is necessary to go back; take a second, third or fourth picture, or as many as may be necessary, until sufficient callus formation has taken place to hold the fragments where you have placed them.

The consensus of opinion is so general regarding the value of the x-ray that it is unnecessary to discuss it further. If you wish to keep out of trouble and keep from being humiliated by having a patient tell you he has a fracture instead of your telling him he has a fracture, you had better x-ray all the cases as they come to you. If you do not, you may lose your great value so far as the railroad, or the corporation, or whatever you represent, is concerned.

As to Dr. Chace's oblique treatment, I know nothing of it. In regard to Dr. Gessner's remarks, I feel very grateful to him, for my first operative training was done under him, but I cannot agree with him regarding the Parham-Martin band. This is simply the cotton bale tie in such general use throughout the South. It can be introduced with a slight degree of trauma, but some trauma is produced in passing the band around the bone. Of hardware, it gives the least amount of trouble. An oblique fracture can be held with the Thomas splint or the modification of the Bradburn splint in more than 75 per cent of the cases, if you take off your coat and work. I would rather use the Parham-Martin band than any other hardware.

Dr. Garner's report is very encouraging, but I have not been able to get his good results in using the Lane plate. I have to take out most of mine.

Dr. Carroll said that in the future there would be fewer open operations. I believe this is true, and if you will check your work with radiograms and use these splints his statement will be verified.

What Dr. Harper said regarding epiphyseal fractures is very important. I have known of several cases where children have been brought in with supposed fractures, who had epiphyseal separations. The diagnosis of epiphyseal fracture is principally clinical. The x-ray is of little or no assistance in some cases. You should have the clinical history and the x-ray. Do not depend solely on either one. Epiphyseal separations, without displacement, will often fool you if you are not on the lookout for them.

As to Dr. Baer's statement about not putting on casts or splints in people of sixty years of age or more, with fracture of the hip, this is ancient history. We should not take this view of the cases and such an authority as Dr. Baer can do a great deal of harm by such a statement. If you will put a Thomas splint on them and swing the limb from a Balkan frame they can be made perfectly comfortable after the first few days. There is no reason why they should develop hypostatic congestion of lungs, bed sores and the like, and every reason that you should expect a reasonably good result, with bony union and function, though the latter may be limited.

DEEP X-RAY THERAPY IN THE TREATMENT OF METASTATIC PAIN IN CARCINOMA OF THE PROSTATE*

By C. A. Waters, M.D.,
and
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A review of a large series of cases of prostatic carcinoma reveals the fact that metastasis to the bones is a very frequent complication. The bones of the pelvis and lower lumbar spine are most frequently attacked; but the process may and often does extend to the upper portion of the spine, to the ribs and to the extremities. The metastases may become extensive before their presence is discovered because their development is insidious. Roentgen examinations of all prostatic carcinomata should be made at frequent intervals in order to recognize their presence.

When the metastases appear in the bones they are usually accompanied by pain which is very severe and very resistant to treatment. Radiation is the only means that we have of alleviating this condition. At first radium was employed and some very encouraging results were obtained, but the method cannot be considered practical for general use because a much larger amount of radium is required than is usually found in our urological clinics.

The introduction of the newer high voltage x-ray therapy machines has provided us with a means of radiation which is within the reach of all and we have employed it recently in the treatment of the condition under discussion. After having determined the location of the lesions, the dosage is estimated for each individual group of metastases to be treated. The dosage usually approximates 1800 milliampere minutes, but no attempt has been made to fix a rigid standard because the location of the lesion largely influences the amount of radiation one is able to use. As is well known, some of the structures of the body are much more susceptible to radiation than others. Hence, if such structures are in a position to receive a large amount of radiation during the course of treatment the dose must be modified.

The patient is kept under close observation during the course of treatment. The condition of his blood is watched and any indication of undue irritation of the intestinal tract calls for a cessation of treatment until the irritation subsides.

Sufficient time has not elapsed in which to treat a large series of cases, but striking results have been obtained in some of them. Some have been entirely rid of their pain while others have been partially relieved, but in no case has there been failure to obtain some relief. It is felt that the treatments are distinctly worth while if nothing more is accomplished than relief of pain.

It is not maintained that the patients are cured because their pain is relieved, and it is very difficult to give a logical explanation of the manner in which the relief is brought about. The pathology of the metastasis indicates two distinct processes: the osteoclastic or bone destroying process and the osteoplastic or bone producing. When the osteoplastic process predominates, the pain is more intense than when bone destruction is more marked. It is possible that radiation reduces the pain by destroying the large masses of new bone and enlarged glandular nodes which are present in the osteoplastic type and which have been pressing on the nerves.

None of the cases has suffered any material damage to the skin, none has been excessively shocked and it has not been necessary to transfuse any of the patients.

The work in this group of cases has been too recent for us to regard this discussion as other than a preliminary report.

A history of a typical case is attached:

Case I.—L. R., a markedly undernourished white man of 71 years, came to the Johns Hopkins Hospital in March, 1922, complaining of urinary frequency, a small stream and intense pain in the left hip and lower back.

Examination showed an extensive carcinoma of the prostate with metastasis and obstruction. The

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bladder urine was infected, and contained pus and cocci.

The patient was first treated by means of a retention catheter, and later a prostatectomy was performed. After sufficient tissue had been removed to relieve the obstruction seventeen radium tubes of one millicurie each were inserted into the remaining portion of the prostate and seminal vesicles.

Following the operation, the patient did fairly well, although he was very feeble. The pain in the left hip continued to increase and was only partially controlled with large doses of morphin.

On June 5, 1922, the patient was referred for deep x-ray therapy.

The treatments consisted of 4 milliamperes of current, 200,000 volts, focal distance 50 cm., filters 0.5 mm. copper, 3 mm. aluminum, given through seven portals of entry approximately 14 x 20 cm. in size over the pelvis, hips and back. In all, the patient received 1800 milliampere minutes from June 6 to 16.

There was no nausea or vomiting incident to the x-ray treatments and no erythema developed by the day of discharge.

The pains in the hip began to subside after the first few exposures and had entirely disappeared by the time the treatments were discontinued.

Four months after the patient entered the hospital, that is, on July 24, 1922, he was discharged, with the following note:

"During his stay here he has been subjected to perineal prostatectomy, radium emanations and treatment with deep x-ray therapy over the back, hips and abdomen for metastasis. This patient has been entirely relieved of the pain in the left hip and back.

"Shortly after x-ray treatments were begun the patient noticed a diminution of the former severe pains in the back and thigh, and after the fifth treatment the pain had entirely disappeared and has not recurred up to the present time.

"The wound has not entirely healed, but most of the urine passes through the penis in a good stream and without pain. The skin over the thigh and buttocks became brown following the x-ray treatments and is still slightly brownish at the time of discharge."

DISCUSSION

Dr. John T. Geraghty, Baltimore, Md.—I have had an opportunity to follow some of the cases that Dr. Waters has treated, three in particular that had suffered pain that was controlled with difficulty by morphin. All three of these cases were markedly relieved of their pain. I do not believe that x-ray therapy at its present stage of development will cure all cases, but if we can give them relief from their pain, whether they have metastases or not before they develop their pain, it brings up the possibility that we may lengthen their lives and prevent the development of their terrific pain.

Dr. H. W. E. Walther, New Orleans, La.—My work in deep x-ray therapy in malignancy of the prostate has been limited, but I think there is a definite field for it. I have seen two or three cases that were unquestionably relieved of pain. We are not going to do much curing in advanced carcinoma of the prostate, but we can accomplish something by relieving the pain as Dr. Waters said.

I wish to add a warning here, relating to over-radiating with the deep x-ray apparatus, not alone because of the superficial burns but because of the generalized reaction that follows this treatment. I hear no one speak of, and read nothing on, radium and deep x-ray therapy shock, but to me it is a much more serious problem than surgical shock. I have seen this more in the practice of others than in my own because I try to be conservative, but there is a definite condition of shock that follows the over-radiation, and I have seen at least one fatality that I could not attribute to any other cause than radiation shock. We must move slowly in this matter, as we have done with radium, and where the deep x-ray therapy apparatus is available, give our patients the benefit of whatever it may hold out.

Dr. Waters (closing).—This work must be undertaken with great caution and Dr. Walther has sounded the keynote in speaking of over-dosage. Formerly radium caused aplastic anemias, in which the patients could not get out of bed again after the treatment, but became weaker and died. The only way of overcoming that is to graduate the dosage according to the blood count. If the white count is down to four or five thousand you must cut down the radiation a great deal, and if it is up you can give a much larger dose. What the standard is we do not know. Many patients have low hemoglobin and rather low blood count, but the point we must pay particular attention to is the white count. The dosage necessary to relieve the pain is not large enough to produce damage to the skin. In a group of cases of carcinoma of the breast with metastases we have had some very unpleasant complications. Several of them have developed aplastic anemias and two have died where under the old type of treatment with the small dosage we could have kept them alive for several years. This happened in the early days of our work. By carefully watching the blood picture and graduating the dosage accordingly there should be little future danger here.

A CASE OF ABDOMINAL PREGNANCY AT SIXTEEN MONTHS

By H. S. Geiger, M.D.,
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and
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Orlando, Fla.

Cases of ectopic gestation arriving at full term are necessarily of unusual occurrence. In the case reported below medical advice was not sought until six months after the death of the full term fetus.

REPORT OF CASE

History.—A colored woman, M. F., married, aged 33, was first seen September 5, 1922, complaining of enlargement of the abdomen. Her family and past history were negative. She had had one child and two miscarriages. Her complaint at the time dated from October, 1921, when she consulted a physician in regard to a "lump" in her lower abdomen. She had missed one or two menstrual periods, after which there was a little "staining," and she was nauseated and had milk in her breasts. She had had no attacks of sudden severe pain in the lower abdomen. She was told by the physician consulted that she was four or five months pregnant and should be confined the following February. The enlargement of her abdomen continued and she asserts that she felt movements. She considered herself pregnant and engaged a midwife. During this time she had considerable pain in the abdomen. Labor failed to set in at the expected time and she no longer felt "movements." Menstruation returned and was apparently normal. There had not been at any time any unusual bleeding from the uterus. The abdominal enlargement became somewhat less, and she lost considerably in weight and strength.

Examination.—A mass occupied the entire abdomen, the size and contour corresponding to that of an eight months' pregnancy. There were no irregularities of the surface. There was considerable tension, but fluctuation could not be elicited. Nothing corresponding to fetal parts could be palpated except in the right iliac region, where a small, apparently bony, protuberance could be felt. The consistency of the mass was something less than that of a pregnant or fibroid uterus. Vaginal examination was negative, the cervix being firm and normally placed. Uterine souffle or fetal heart sounds were not demonstrable upon auscultation. The heart, lungs and urine were negative. The temperature was 100.6° Fahrenheit, pulse 120, respiration 26. The systolic blood pressure was 110, the diastolic 80. The patient had lost twenty-five pounds in weight and was manifestly toxic. A tentative diagnosis of abdominal pregnancy was made and abdominal section advised. She was admitted to the Orange General Hospital, Orlando, Fla., September 8, 1922, to the service of one of us (J. S. M.).

Operation and Results.—Incision in the midline revealed a large cystic mass occupying the entire abdomen as high up as the ensiform, with densely inflammatory adhesions to the omentum and small and large intestines. The uterus, normal in appearance, was pushed far to the right. It being impossible to separate the sac from the intestines, owing to the adhesions, the sac was opened and about three quarts of brownish fluid having the odor of stale urine were removed by aspiration. The opening in the sac was enlarged and a dead, macerated fetus was delivered and removed. The necrosed placenta was removed as far as possible and drains were introduced into the sac and the sac sewed into the abdominal wound. The abdomen was closed in the usual way. Convalescence was slow but uneventful. The male infant was well developed and at full term, weighing 6¾ pounds, length 19 inches, with long, black hair and fully developed finger nails.

The history, as given by the patient herself, was a great aid in arriving at a diagnosis. The ability to give so clear a statement of facts is remarkable in an individual of the class to which this patient belonged.

EYE, EAR, NOSE AND THROAT

ROUTINE PROCEDURE IN EYE BALL AFFECTIONS*

By Robert Caldwell, M.D., F.A.C.S.,
Little Rock, Ark.

This paper will not deal with benign or malignant tumors, cataracts or glaucoma. Neither will time be spent on traumatism, or infections following trauma, but the author will confine himself to a few of the other pathological eye ball affections as seen in his office from day to day. The similarity of etiology and, therefore, similarity of treatment is so noticeable in pathological conditions of the tunics of the eye that I find myself using the same process of elimination in keratitis, iritis, uveitis, retinitis, etc.

Lues, autointoxication, foci of infection, tuberculosis, malaria, blood pressure and kidney diseases spell the tale in most cases. In fact, there is argument to prove that foci of infection are always responsible, and that lues, tuberculosis, autointoxication, blood pressure and kidney diseases are dependent on a focus somewhere else in the body before the eye is affected.

Particular attention should be given to a complete history of all cases. The family history will ofttimes give us important data where we are led to suspect tuberculosis or syphilis. The general system history, such as loss of weight, appetite, slight fever, and especially night sweats, will direct our attention to tuberculosis, just as miscarriages and loss of children in women and loss of brothers and sisters in early childhood make us suspect lues. In hereditary lues we also have the advantage of the characteristic ear marks of the disease, such as frontal eminences, Hutchinson's teeth and bulging forward of the tibia in acquired syphilis, the Argyl-Robinson pupil, Romberg, and loss of knee reflex. The general history as regards infections in early childhood, especially if these infections have been followed by such sequelae as suppurative otitis media, or chronic catarrh, will give us valuable information; also an old urethritis or prostitis following a long-standing gonorrhea. The history of long-standing chronic malaria, like obstinate constipation with its resulting autointoxication, may be easily overlooked in our zeal to treat the eye while neglecting the general system. Never forget that high blood pressure and nephritis do not confine themselves alone to the aged, and a well conducted inquiry will ofttimes elicit information that directly puts us on the track that leads to valuable information and a positive etiological finding. The history of bad teeth, frequent colds, chronic catarrh, or tonsillitis helps, even if we expect to eliminate these in our diagnosis.

Just a few words as regards etiology in general. Lues is pre-eminently so predominating a causative factor that I shall only mention it and pass on.

Autointoxication may not be directly the whole etiological factor in many cases, but its influence in retarding the speedy recovery of many affections is very manifest. Mr. James Alexander Wilson[1] says:

> "Of all the intra-ocular structures, the ciliary body and iris are most liable to be affected by microbes and toxins, and when affected their resistance to treatment may be due to our inability to recognize the toxin or its source."

He quotes Sir William Arbuthnot Lane as saying that in intestinal stasis the eyes are always affected, and that they afford a delicate indication of the degree of autointoxication. Mr. Wilson recognizes microbic, metabolic and chemical toxemias. He highly recommends low diet, uncooked vegetables and exercise. Dr. A. C. Macleish[2] says:

> "Functional disorders of the eye due to disorders of the intestinal tract are constantly being met with, and in such varied forms that there seems to be no limit to their variety."

He emphasizes particularly the overindulgence of sweets in children as responsible for many eye affections. Dr. George Huston Bell[3] has this to say:

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*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

"Every patient that comes into my office must stand the acid test of the three T's, teeth, tonsils and toxemia."

He first inspects the mouth, palpates the gums, x-rays the teeth, dead or live ones, pivots, arches and bridges. He says any part of the eye may be attacked as the result of dental infection, but far the greater number of cases show the iris, ciliary body, choroid or cornea to be affected. He blames teeth, candy and sweets for most cases of eczematous kerato-conjunctivitis. A toxemia of the gastro-intestinal tract is set up. He eliminates the candies and sweets, cures the teeth, treats the eyes locally, and the patient gets well. He does not call these cases tuberculous.

We all are aware of the fact that too much candy and sweets set up an intestinal toxemia that is productive of corneal involvement, but we must not forget that a diet rich in protein may have a very undesirable influence in our eye affections. I am reminded of a saying of one of my professors in the good old days when he was lecturing on gout: "Eliminate the meats, sweets, wines and beer." I believe while eliminating the sweets, due consideration must be given to meat and eggs, with a memory of moonshine.

Focal infection is now occupying the stage, not only in eye pathology, but in body ailments of varied and sundry forms. If we knew more about the bacteriology or toxemia of iritis and uveitis we should be more able in our treatment. Then we might utilize to a better purpose the bacterines as given us by our pathologists from foci around teeth, tonsils, sinuses and prostates.

Dr. W. L. Benedict[4] says:

"Rosenow has shown that organisms taken from diseased teeth are capable of producing diseases of the eye when injected directly into the blood stream of animals, and furthermore, that such organisms have a selective affinity for certain structures of the eye, and that within limitations, the selective affinity is characteristic of the strain and is maintained through several culture transplants of the organism."

Dr. Frank Billings[5] classes syphilis and tuberculosis as focal agents as far as producing eye affections is concerned. He says:

"In a consideration of iritis as a metastatic infection it must be kept in mind that both syphilis and tuberculosis are metastatic infectious diseases. Iritis, which may occur in either one, is due to hematogenous infections from an existing focus somewhere else in the body. We all who have had much experience can recall more than one case of bad eye that has resisted all forms of treatment until a certain focus of infection was removed."

The limits of this paper will not allow a discussion of the method of transmitting this infection from a focus to the eye. We must not be content to examine only the teeth, tonsils and nose, but must realize that the focus may be at some point far distant from the eye and the help of an internist is often necessary before conclusions are to be drawn.

Tuberculous conditions of the eye have been neglected much in my practice within the past. Take, for instance, the children with enlarged cervical glands, nasal discharge, poor development, slight rise in temperature, one or all the above associated with small macular corneal ulcers very close to the limbus, kerato-conjunctivitis or phlyctenular ulcers with intense photophobia; or older people with macular or crescent shaped corneal ulcers close to, but not extending to, the limbus, kerato-conjunctivitis, episcleritis, scleritis, iritis, uveitis or retinitis. We will find tuberculosis more often than we formerly suspected. There are two particular conditions of the cornea that I have found more than once to be tuberculous. One where there is a little ulcer the size of a pin head, or maybe two or three such ulcers very close to the limbus. Perhaps they have united and formed a crescent ulcer very close to, but not involving the limbus. The other is a kerato-conjunctivitis where the conjunctiva has grown out over the cornea and large blood vessels extend over onto the cornea, really a hypertrophy of the corneal conjunctiva.

Dr. H. H. Stark[6] believes that when the eye is infected with tuberculosis the most frequent points are the iris, choroid and retina, less frequent, the cornea, sclera and optic nerve. Most of my cases have been in the cornea and retina. He draws the following conclusions, with which I agree heartily:

(1) Localized tuberculosis of the eye is a far more common disease than is generally admitted.

(2) The diagnosis can be made by subcutaneous administration of old tuberculin up to the point of saturation.

(3) The administration of some form of tuberculin is warranted by the rapid improvement and arrest of the process which results in a possible cure in the majority of cases.

The same author, in another article,[7] calls attention to a silvery white reflex in the retina and along the retinal vessels, at times so dense that it simulates an exudate. I have seen this silvery white reflex. Some authors report seeing small tuberculous nodules on or in the iris. This I have never seen.

Malaria has been held responsible for more than one case of keratitis and corneal ulcer. I used to treat all cases of dendritic keratitis and certain corneal ulcers as malarial, but since I have been requesting a blood examination for malaria in all such cases, I have come to the conclusion within my own mind that possibly malaria exerts its influence by weakening offensive and defensive powers of the patient, and most often some other factor is responsible for the affection.

Kidney disease has been recognized by the ophthalmologist in his fundus examinations so many times before any other symptoms of a nephritis or diabetes was found, and we have been trained so well as regards the retinal pictures of nephritis and diabetes, that I shall only mention them and pass on. Blood pressure is so interwoven with other diseases that I shall do the same with it.

After the above brief resume of etiological factors in general, I shall now outline to you how we proceed with an eye case that comes into our office. After a complete family and general history, with all the data that can be gotten as regards the present trouble recorded and the vision taken if possible, the cases are divided into two classes, one capable of refraction or a fundus examination, the other that class of cases where refraction or fundus examinations are not possible in a degree to be advisable. The first class are refracted, vision taken with or without correction, the field of vision is taken with especial reference to scotomas and the blind spot, then a thorough fundus examination is made, with or without mydriatics, as deemed best, and a tentative diagnosis made. The non-refractive cases are inspected, a loupe used if necessary, and a tentative diagnosis made. Now we make an effort to find the guilty agent producing the trouble. It may be that our history and the progress of the disease, together with the clinical picture, leaves no room for doubt, but in most cases we arrive at our etiological diagnosis by the process of elimination.

First the mouth and teeth are inspected, tonsils pressed to see if debris and pus are present, nasal chambers are inspected before and after a shrinking of the mucous membrane, and frontal and maxillary sinuses are transilluminated. Particular attention is then given to the posterior ethmoid and sphenoid regions. In diseases of the retina, choroid and optic nerve we very frequently irrigate the sphenoid sinus with sterile water to see if pus is present; also we look for that characteristic dish-water-hand look of the mucous membrane in the area of the posterior ethmoid and sphenoid, as we believe that is significant of pathology in that region. Then, after inspecting the ears, larynx and lachrymal sac, we consider our head examination fairly complete. From here on we prefer to take the case up with the family doctor, or some good internist, and together we go over the question of diet and autointoxication. He gives the patient a thorough examination and hunts for other foci of infection. We advise a blood Wassermann, blood examination for malaria, x-ray of the teeth and teeth producing area. An x-ray of the sinuses, blood pressure reading and a complete urinalysis are made in all cases. In certain types of cases we believe no examination is complete unless the hypodermic tuberculin test is made; also in any case where we have been unable to find any etiological factor the tuberculin test should be made.

I wish to emphasize particularly the importance of having the assistance of a good internist in most of these cases. Just as no man can live to himself apart, no eye condition can exist to itself apart from the other body structures.

Treatment resolves itself into a threefold process concerning the dentist, the

specialist, and the general physician. The treatment will depend entirely on the etiological findings. The dentist must remove any and all foci of infection around teeth and gums. It is up to us to remove any and all foci as regards tonsils, nose and ears, and for the general man without help to correct the kidneys, blood pressure and autointoxication, and treat the malaria, lues or tuberculosis.

Just a few words as regards that class of cases of retinitis, uveitis and optic neuritis in which no etiology is certain. We believe these cases should be treated expectantly, if acute, with pilocarpine sweats and hot packs and with plenty of elimination; if chronic, with the iodids and plenty of elimination. We do not believe in operating upon the sinuses of the nose unless demonstrable pathology is present. We do not believe that an exenteration of the posterior ethmoids and sphenoids is justified on general principles. Such operations are not by any means free from danger, and such a precedent, we believe, would lead to many useless operations.

Drs. Lorie and Lichtenberg[8] say:

"In all cases with enlargement of the blind spot, a careful rhinological and x-ray examination should be made, and in those cases where both are negative we earnestly suggest an exploration of the sinuses, paying particular attention to the posterior ethmoid as the most probable site of the disease."

It may be that the enlargement of the blind spot is a sufficiently constant symptom, and sufficiently peculiar to these diseases that we will be justified in operating. My experience is not sufficient to discuss the point.

Nothing will be said regarding local treatment in these cases, as each case will demand its own local therapy. As to bacterin in eye diseases, I have had very limited experience. I have used Neisser serobacterin in cases of iritis giving a history of gonorrhea with seemingly good results. With the non-specific proteins, such as diphtheria antitoxin, yeast serum, milk injections, proteoses, albumoses, hypertonic salt solution or typhoid vaccine I have had no experience.

Before dismissing this subject to report a few clinical cases let us never forget that a patient may have a bad tooth, yet syphilis may be producing his trouble, or he may have lues and a bad tooth may be causing his trouble. So no case is complete until all factors are eliminated.

Case I.—G. A. C., a brakeman, age 41, came into my office November 17 giving the following history: His eyesight was getting dim in the left eye. It began to fail just a few days previously. He had a severe continuous pain in the left eye. His family and general history were negative. He had never had any trouble with either eye before. Vision in the right eye was 20/20. Vision in the left eye was 20/40, not improved with glasses. Ophthalmoscopic examination and fields of the right eye were normal. Ophthalmoscopic examination of the left eye showed distinct papillitis and the retina vessels were velvety in appearance. There were no floaters, hemorrhage or white spots. Field of vision of the left eye showed an almost complete scotoma of the upper nasal quadrant. This reached almost to the blind spot. The blind spot was not enlarged. On inspection, mouth, teeth, tonsils and ears were negative. The septum was deflected so much to the left that we could not investigate the posterior ethmoid and sphenoid areas. Muco-pus was seen in the rhino-pharynx and the rhinoscopic mirror showed that it seemed to be more from the left nares. X-rays of the teeth and sinuses were negative. Wassermann and malarial smears were negative. Urine was negative. There was no history of intestinal trouble. No tuberculin test was made. On November 21, 1921, the submucous operation was made and the right middle turbinate removed, with an expectation of ethmoid and sphenoid operation within a few days. The patient was entirely free from pain on November 23, 1921, and the pain has never returned yet. On December 28, all signs of pathology were absent in the left eye and the fields and vision were normal. The left side of the nose was free from pus.

Case II.—I was called to see Mrs. C. J. J., age 26, on December 21, 1921, and the following history was given: The patient was vaccinated two weeks previously and became sick the preceding day with a generalized headache and no other symptoms. The vaccination wound seemed to be normal. On December 21 the patient was drowsy and complained of absolute blindness. Ophthalmoscopic examination was absolutely negative and hysterical blindness was suspected. Neurological examination was completely negative. On December 22 the patient could not lift the left leg. This day I thought I could make out a little blurring of the temporal edge of the left disc. Temperature and pulse were normal.

The tonsils had been removed, teeth were in good shape, blood and spinal fluid Wassermann were negative. Malarial smears were negative. Encephalitis was suspected. The cell count was not increased as we would expect, yet the fluid ran out under pressure. Globulin was not increased and the fluids were clear and sterile. Nose examination was negative. On December

23 the patient was still drowsy and complaining of a severe headache, absolute blindness and inability to lift the left leg. This day I made out a distinct blurring of the borders of each disc.

What did we have? Was it a case of lethargic encephalitis, metastatic involvement from vaccination or sinusitis? The patient remained in this condition for about ten days.

Optic neuritis became much worse, until the swelling of each disc was about two diopters with numerous hemorrhages in the neighborhood of each disc. January 20, ophthalmoscopic examination was unchanged, but the patient could see hand movements, could move the left leg, and the headache was much improved. I can see how it would have been possible to operate on the sphenoid and ethmoid in this case, but because I could find no pathology I would not operate. A blind spot examination was out of the question. From January 4 to February 1, the papillitis gradually improved until on May 31, 1922, vision in each eye was 20/20 with correction, and on August 23, 1922, it was 20/15 in each eye with correction. The fields were normal. It was easy at that time to know that we had been dealing with one of the benign types of lethargic encephalitis.

Case III.—On May 11, 1922, E. C. D., age 28, came into my office suffering intensely with pain in the right eye. He had two muscular corneal ulcers about the size of a pin head, one at 10 and one at 11 o'clock, about 4 mm. apart, about 3 or 4 mm. from the limbus. Teeth, tonsils, ears and sinuses were negative and the patient was advised to have x-rays of the teeth and sinuses, Wassermann and malaria tests, also complete urinalysis and a tuberculin test. Atropin and dionin were given. He returned May 12 and 13, with no improvement. And on May 14 I was called to see him, at which time the two ulcers had united and a crescent shaped ulcer was present about 4 mm. in width.

He had not had the advised tests made. On May 15, x-rays of the sinuses and teeth were negative and blood was taken for Wassermann, which proved negative. Malaria test was negative, as was the urine, but on May 16, after a hypodermic of tuberculin on May 15, the eye was much worse. The patient's temperature was 102°, and the site of the injection was swollen and indurated. On May 17 the patient was slightly better, and when seen last, May 27, he was practically well. This patient received the tuberculin treatment.

Case IV.—January 10, 1919, I was called to the hospital to see Mrs. W. A. G., age 24, who was sent in for a mastoid operation. Her illness had begun about two weeks before with sore throat, followed by pain in the left ear and left side of the neck. The ear drums and mastoids were negative, lymph nodes along the left side of the neck were palpable and tender, tonsils enlarged, submerged and cryptic and the crypts contained debris and pus. The tonsils were treated for one week, enucleated and the patient was sent home. She was not seen again until December 9, 1919, at which time she came into the office complaining that for the previous month she had been having blind and dizzy spells that lasted a minute. For the previous six months she had been having severe pains starting in the back of the head and localizing behind the eyes. There was also a troublesome thumping in the left ear. The patient thought glasses might relieve the headache.

The pupils were dilated with atropin and correction with plus 100 sphere combined with plus 2.50 cylinder axis 90 in the right eye gave vision of 20/30. A plus 3.00 sphere combined with plus 3.50 cylinder axis 90 in the left eye gave 20/30 vision. The fields were negative. The ophthalmological report was then negative, though the optic nerve may have looked a little too white. Nose, teeth and ears were negative to inspection, but by putting my ear in contact with her left ear I could easily count the pulse beats by the bruit-like sound I heard. X-rays of the sinuses and teeth were negative, Wassermann and malaria tests were negative, and the urine was normal. The sphenoids were irrigated and no pus was found. The pituitary showed no enlargement to the x-ray. The mastoid was x-rayed and found normal. The patient went to a general surgeon and had one ovary and part of another removed with no relief. My glasses gave her better vision, but did not give relief from pain. I had no opportunity to examine this patient again until November 11, 1920, at which time she came into the office complaining that the pain was worse and that she was almost blind. Her vision had fallen to 20/40 in the right eye with correction and to fingers at one foot with the left eye. Ophthalmoscopic examination of the right eye showed the right disc ragged around the edges, nerve head rather white and the arteries and veins tortuous and indistinct in places. The left disc was white, edges were moth eaten, arteries very tortuous on the disc and indistinct and tortuous all over the fundus. The optic nerve was very white. The thumping in the left ear was very exaggerated. Pulse and temperature were normal. Complete examination was again made by a competent neurologist in conjunction with an x-ray and pathological laboratory, and we all acknowledged that we could not make a diagnosis.

To make a long story short this patient was operated upon last summer and a large angioma of the brain was found on the left side. She was interesting to me, because I saw it so early and had a chance to examine it more than once, and with the best help I could get could make no diagnosis. Had I operated upon the sphenoid or ethmoid it would have done no good. The patient was last seen about a month ago and she may be a little better. The angioma was not disturbed, but Dr. Cushing, who did the operation, advised x-ray treatments.

Case V.—Mrs. W. H. H., age 28, was seen by me January 1, 1920. She gave the following history: "I was confined about two months ago, and three days after the confinement I began to have fever and sweats, which have continued un-

til the present time. My eyesight began to fail at that time and has gradually grown worse until now I can hardly see. Light hurts the eyes very much." Her family and general history were negative. Vision in the right eye was fingers at four feet; vision in the left eye, fingers at six feet. On inspection, the cornea of each eye was found to be traversed by large blood vessels, and the cornea had a beefy appearance. The patient had been treated by other specialists with atropin, dionin, powdered calomel and argyrol, with no relief. Nose, mouth, teeth, tonsils and ears were negative. Dr. A. C. Shipp was requested to make a complete examination of the patient to see if he could find any etiology. Wassermann and malaria tests were negative. Urine, blood pressure and intestinal tract were negative. Some doubtful pathology was made out in the upper lobe of the left lung. A tuberculin hypodermic test was given June 2, 1920, and the next day the temperature was 103°, the eyes much worse, site of the injection swollen and much indurated, and well-marked pathology was made out in the upper lobe of the left lung. The patient was treated with tuberculin, the pupils were kept dilated with atropin, and she made a very rapid recovery. When last seen on January 10, 1921, vision in each eye was 20/40, with the hope of future improvement. This case is interesting because it had been treated by the old methods for two months without any relief, and the improvement was very rapid after tuberculin was started.

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DISCUSSION

Dr. D. D. McHenry, Oklahoma City, Okla.—The Doctor seemingly is finding many more tuberculous infections of the anterior part of the eye than I am. He spoke of the tuberculous condition in marginal keratitis. This is usually found in the child, occasionally in the adult, that has attacks of fever and especially many enlarged submaxillary glands. Those cases that we used to call scrofula, in which the general surgeon removed many of these enlarged glands, were often undoubtedly tuberculous, especially those that had keratitis. But I feel quite certain that many of those that were called tuberculous and were operated upon were simple infections from the mouth, teeth and tonsils. Quite a few of them had been advised to have the glands removed because they were tuberculous. One specific instance: a young lady came to me ten days before her approaching marriage with a very large, inflamed mass of submaxillary glands which her doctor said would break down and have to be opened. She had been told she had badly infected tonsils, which I found to be true. I told her that my experience was if the infected tonsils were removed the glands would be reduced. I removed the tonsils and the glands did recede and entirely cleared up without breaking down.

I could cite dozens of such cases where submaxillary glands that were repeatedly called tuberculous got well without removal of anything but tonsils and teeth. The best statistics I can find show not over 11 per cent to be tuberculous, so I am inclined to question some of these cases the Doctor calls tuberculous, because of my experience with them from the standpoint of a throat man.

Dr. M. F. Arbuckle, St. Louis, Mo.—I want to emphasize the admonition that the specialists be at all times in close cooperation with the general practitioner. I would like to add to that group the neurologist.

Dr. Caldwell has mentioned the matter of operating on the sinuses in the absence of a diagnosis of sinus disease. It is my feeling that if the eye disease depends upon the sinus disease for its cause, usually the sinus disease can be discovered with proper examination.

I have had a little experience with the matter of differential diagnosis between tuberculosis and other forms of eye disease, from the standpoint of the oculist. I do not do eye work. There is one man in St. Louis with whom I have done considerable wrestling. He was of the opinion that a great many of these eye lesions are tuberculous. Dr. Caldwell, it seems to me, has a greater proportion of inflammatory lesions that show tuberculosis as the cause than has been my experience, and I would like to ask him to go into that matter for a moment when he closes.

Dr. Caldwell (closing).—I wish to emphasize the fact that in my doubtful cases I work in conjunction with a good internist, and if tuberculosis is suspected the case is referred to a tuberculographer, and neurological and luetic cases are referred to a neurologist or a syphilographer. I never give neosalvarsan or tuberculin myself, but I always refer these cases, and maybe that is why I am finding more cases of tuberculous eye trouble than the other fellow, because I am working in conjunction with a man who is paying special attention to tuberculosis. After the other foci of infection have been eliminated and we cannot find any cause of the trouble, we never hesitate to try the tuberculin test.

In regard to the sinuses, that has been an open question with me, and I have been reluctant about operating upon any sinus unless fairly well demonstrated symptoms were present.

REVIEW OF THIRTY-TWO CASES OF ENDOSCOPY WITH LANTERN SLIDES*

By E. W. Carpenter, M.D., F.A.C.S.,
Greenville, S. C.

Great good might be accomplished by impressing our confreres to be on the outlook for foreign body cases, as many of them fail of recognition. Some of the cases presented in this review knocked about from pillar to post for months before they were recognized. We believe there are many unrecognized cases within a relatively short radius. We recognize the average operator's limitations with the bronchoscope. We also realize the large field of usefulness of endoscopy in diseases of the esophagus, where it is not being utilized. There are many interesting and difficult phases of this work, but the most difficult is the diagnosis in the doubtful cases. In these doubtful cases, as in most of our medical experiences, we find that a careful history is of the utmost importance. Cough in these cases is not as important a symptom as it was formerly thought to be. We have learned that the lungs are quite tolerant under certain conditions.

We seldom use an anesthetic. With older children and adults we apply local anesthesia. Any adjustable operating table has always served our purpose. Suspension is used only for surgical work.

The low operation is seldom justified. The necessity for tracheotomy is not always the result of awkwardness and trauma, for many subglottic spaces are as sensitive as a mimosa and resentful of being handled. In some very septic and moist cases with poor drainage we think tracheotomy hastens recovery.

Small light foreign bodies like grains of corn and watermelon seeds in some cases float loose in the trachea and at every cough strike the lower surface of the cords, irritate the subglottic space and cause marked edema.

In this series of thirty-two cases the youngest was seven months and the oldest seventy years. Deaths were two.

In case No. 18, the foreign body was a burr from a clover. We think this is the first report of such an object. This case was of two months' duration and was in a very septic condition. We did a tracheotomy to promote drainage, as breathing was moderately thick for several days. A septic temperature developed with cellulitis of the neck and a foul condition of the wound. On refusal to take food we inspected the fauces and were amazed to find a universal softening diphtheria membrane. On imparting this information to the mother she remarked, "Why, that is nothing. I had the same thing in my throat two weeks ago." We did not use antitoxin, because the child was then improving and had developed its own antitoxin. The chest contained abundant pus.

Case XXVI.—An infant of seven months had inhaled stearate of zinc. This was our first experience with this substance and the case presented interesting features. Vesicular breathing could be detected only in the anterior left lobes and the anterior lower right lobe. The chest was greatly distended and rigid, with practically no respiratory movement. The respiration ranged around 120 for several days. Repeated x-rays were negative for the clumping of the zinc. On the fourth day a suspicious area appeared in the right bronchus, but a rapid endoscopy revealed nothing. The infant was given oxygen as often as cyanosis developed, which was every fifteen to twenty minutes, day and night, for seven days. On the eighth day the family physician gave hypodermic small doses of epinephrin and the respiration began to drop. On the ninth day it was practically normal. No elevation of temperature or moisture developed at any time. The box of "talcum" powder should not be used as a toy.

Case XIII.—A 7 year old girl was carried to the family doctor by the mother with the statement that she had "swallowed a small safety pin and had a severe choking spell." The doctor's reply was, "Let's wait and see if any bad symptoms develop." At the end of seventeen months the child was rushed to a hospital for an emergency "appendix" operation and a roentgenogram revealed the safety pin low down in the right bronchus. The emergency was probably a diaphragmatic pleural involvement. Three weeks after this I was invited to remove the pin.

Case XIV.—Subglottic edema from bombardment of the bean prevented a 4 mm. 'scope from entering the trachea. The bean is seen bumping against the orifice of the 'scope. During tracheotomy the subglottis was blocked. A reverse attempt to seize the bean pushed it into the phar-

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Name	Age	Object	Location	Time in Situ	Type of Operation	Results	Remarks
1. E.F.		Waterm. seed	Trachea	6 hours	High	Recovery	Subglottic edema from bombardment of seed.
2. B.H.	2 years	Nickle	Esophagus	10 days	High	Recovery	Caused very little discomfort.
3. L.G.	1 year	Parched corn	R. B.		High	Recovery	Intubated three hours after removal.
4. C.P.	62 years	Bolus meat	Esophagus	2 hours	High	Recovery	Difficulty in swallowing for several years.
5. C.L.	18 mos.	Citron seed	L. B.	24 hours	High	Recovery	During examination seed loose in trachea.
6. H.H.	70 years	Roast beef	Esophagus	6 hours	High	Recovery	Had no teeth.
7. C.B.	23 mos.	Fragm'ts peanut	Trachea R.&L.B.	30 hours	High	Recovery	
8. G.B.	14 years	Alderberry	R. B.	36 hours	High	Recovery	
9. B.T.	8 years	Lead bullet	R. B.	24 hours	High	Recovery	
10. L.A.	4 years	Waterm. seed	L. B.	12 hours	High	Recovery	
11. B.H.	2 years	Safety pin	Post-pharynx	4 hours	High	Recovery	Brought an x-ray plate showing pin in the esophagus. Scope failed to locate pin. Screen revealed pin in post-nasal space.
12. M.K.	1 year	Fragm't cow pea	R. B.	36 hours	High	Recovery	Right side pneumonia.
13. M.W.	7 years	Steel carpet tack	L. B.	1 year	High	Recovery	Lower left lung densely infiltrated; cavity lined with large soft granulations and copious pus. Proximal opening of cavity permitted only a 5 mm. scope to enter.
14. A.M.	11 mos.	Dried bean	Trachea	10 hours	Low	Recovery	Subglottic edema from bombardment of bean prevented 4 mm. scope from entering trachea. Bean seen bumping against orifice of scope. During tracheotomy subglottis blocked. Reverse attempt to seize bean pushed it into pharynx and bean recovered in stools in 48 hours.
15. R.S.	4 years	Glass ornament 22x9 mm.	Esophagus	2 weeks	High	Recovery	Could not grasp with forceps. With a Jackson pin closer kept it against the end of the esophageal speculum and removed together.
16. D.G.	19 mos.	Corn	R. B.	?	High	Death	Tracheotomy. Kept in the hospital one week and permitted to return home. Condition perfect. Returned in two weeks; wound had received no attention. Septic wound and tracheitis. X-ray showed three cardinal signs of F. B.
17. E.G.	8 mos.	Bark of tree 7x17 mm.	Trachea	36 hours	High	Recovery	Tracheotomy. Edema from foreign body.
18. N.B.	15 mos.	Clover burr	R. B.	8 weeks	High	Recovery	Tracheotomy. Very septic patient; irregular temperature 104° before bronchoscopy and after tracheotomy. See discussion.
19. L.P.	20 mos.	Apple peel 6x18 mm.	L. B.	24 hours	High	Recovery	
20. S.D.		Peanut kernel	R. B.	20 hours	High	Death	Three diagnostic signs of non-opaque foreign bodies present. Pneumonia and death.
21. D.G.		Sweet potato			High	Recovery	
22. B.H.	18 mos.	5 fragments peanut	R. B.	30 hours	High	Recovery	
23. L.B.	9 mos.	Peanut shell 8x12 mm.	R. B.	6 hours	High	Recovery	
24. J.G.	20 mos.	Corn	R. B.	2 hours	High	Recovery	Three cardinal signs of non-opaque foreign body.
25. R.W.	18 mos.	Corn	R. B.				Three cardinal signs of non-opaque foreign body.
26. B.H.	7 mos.	Stearate zinc	Alveoli	6 hours	High	Recovery	Three-fifths lung not air-bearing.
27. R.W.	20 mos.	50 centime piece	Esophagus	24 hours	High	Recovery	Very small baby.
28. B.R.	4 years	6-penny nail	Stomach	2 hours	High	Recovery	Could not see nail. Recovered third day per via naturales.
29. N.M.D.	9 years	Safety pin	R. B.	17 mos	High	Recovery	Pin rusted and broke easily, imbedded in mass of granulations.
30. A.J.	3 years	Corn	Trachea	20 hours	High	Recovery	
31. A.H.	2 years	Waterm. seed	R. B.	72 hours	High	Recovery	Three cardinal signs of non-opaque foreign body in R. B.
32. J.P.	5 years	Coin	Esophagus	1 hour	High	Recovery	

ynx and it was recovered in the stools in forty-eight hours.

Had my prediction that the bean would be recovered in the stools not been fulfilled, I should have been placed in an embarrassing position.

A study of twenty slides demonstrating cases and problems was presented.

DISCUSSION

Dr. J. F. Townsend, Charleston, S. C.—One of the points the Doctor called to your attention was the absence of cough in foreign body cases except the primary cough when the foreign body is inhaled. When the foreign body is movable it begins to cause an irritation again. I had a case not long ago in which a small seed ran up and down in the trachea, cutting off expiration.

Another point that you notice very frequently is the tolerance to the foreign body when it is not chemically irritating. All foreign bodies, metallic bodies, are retained without very much annoyance to the patient for an indefinite period of time; but some of them of plant nature are quite irritating, especially peanut shell, causing an arachidic bronchitis. Very frequently you have to do a tracheotomy before you can remove it.

Dr. H. Marshall Taylor, Jacksonville, Fla.—The report of the case of inhalation of stearate of zinc is most interesting. The essayist says he did not recognize the stearate of zinc during the bronchoscopy. I would like to ask him if this was a presumptive diagnosis on the history alone.

The pathological observation which Dr. Carpenter has made on the effect of stearate of zinc in the bronchial tree is further evidence of the importance of the specificity of certain types of foreign bodies in the air passages. Likewise Jackson's investigation of the peanut as the etiological factor in the production of a syndrome to which he has given the term of arachidic bronchitis stands out prominently in this phase of bronchoscopy.

In my experience with the sand spur as a foreign body in the larynx, some clinical manifestations have been observed which aroused sufficient interest to stimulate some definite study as to its chemistry. An extensive chemical analysis shows that formates exist in the younger spines of the sand spur and there can be no doubt that this toxic-chemical irritant is a factor in the production of the marked inflammatory process caused by this type of foreign body.

Dr. Clyde E. Purcell, Paducah, Ky.—I heard some general practitioners recently in a medical meeting discussing the extraction of foreign bodies, and the consensus of opinion was that the best thing to do was to let them alone. They said if you send them to the average man he will traumatize the throat and other structures to such an extent that death or other complications arise and therefore the best way out of the difficulty was to advise patients to leave them alone. That matter can be righted only by discussions in societies like this and in our efforts at general education of the public, where every doctor stands in the capacity of a teacher.

I have taken the position before other societies that tube work necessarily will have to be confined to a very few men because of the lack of opportunities to become expert not only in dealing with foreign bodies but in the management of tubes. Opportunities for tube work even in big cities are relatively rare. We must educate the average nose and throat man to direct these patients in a channel where they belong, and to educate the general practitioner that tube work is not only safe but advisable in skilled hands, and that mortality resulting from unremoved foreign bodies is very great. With increasing experience in the management of foreign bodies, we ought to be able to say to the general practitioner that practically all foreign bodies of a size to be located ought to be successfully removed without complications.

I was particularly impressed with the Doctor's idea in regard to non-opaque foreign bodies. I have in mind a case where the symptoms were nil. Every examination, x-ray and physical signs, were negative, with the exception of the history. The parents insisted that the child had "swallowed" a honey locust seed. There was no difficulty in breathing, no cough, and I hesitated abouf passing a bronchoscope, but the parents insisted that this seed had been "swallowed." Finally I did a bronchoscopy and found the seed in the right bronchus. It was immediately removed and the child went home. The interesting thing is that foreign bodies can be symptomless.

I am heartily in accord with the Doctor's idea about the removal of coins. It seems to me the simplest thing in tube work, because usually you have something you can catch in the forceps. There are no sharp edges and no traumatism should result in the extraction.

Dr. W. Likely Simpson, Memphis, Tenn.—One of the things that has helped me in removing foreign bodies is the use of the Lynah suspension apparatus. All large foreign bodies high up can be removed with this apparatus. You do not need anything else. These are much more easily removed in this way than through a bronchoscope. The insertion of a bronchoscope in children is not easy. I make a routine of slipping the suspension apparatus in and do not traumatize at all. You do not have to search for the larynx and epiglottis. You see it and go ahead.

Those of us who have followed Dr. Jackson will not be hurried in the examination for foreign bodies. A doctor may send us a foreign body case (and this is especially applicable to non-opaque bodies) and ask us to diagnose the case immediately. Every case should have a thorough examination, and especially if it is non-opaque we should not be hurried. If it is a metallic foreign body and you do not know where it is, and if it has been in a good while, you certainly should not do it in an hour or two. We should know all there is to be known about the

foreign body first, and then, as Dr. Jackson says, never make an exploratory examination for foreign body unless you have every instrument at hand to do anything that may come up.

Dr. M. F. Arbuckle, St. Louis, Mo.—Dr. Carpenter's first case, the stearate of zinc case, is beautiful, and is almost sure to come up frequently. I have never seen one, but I shall keep my eye out for one now. The diagnosis is an example of good work. The striking thing about it to me is the child's respiration. I would think the child would have died from exhaustion.

The tack case the Doctor showed is another example of the lack of proper, careful, thorough study of the patient. If the child had been properly studied when it was first ill the tack would have been found. It is also an example of the rapid recovery that takes place in those cases after the removal of the foreign body. It is comparable to the removal of a stopper from a bottle, which Dr. Jackson refers to. You simply take the cork out and the contents come out.

Dr. Simpson has just said that he uses suspension for his foreign body cases. I did not hear the essayist describe his method of working, but I would like him to tell us something further about it. I have tried the suspension and the Jackson method, and I am partial to Jackson.

There are some cases in which it does not seem possible to do a suspension without an anesthetic, and for a child with a foreign body in its lung to have an anesthetic is adding fuel to the fire. You are almost certain to get a pneumonia. It may be possible to do a suspension without anesthesia, and if it is I am coming down to see Dr. Simpson and learn how to do it.

He mentioned tracheotomy. That also is a bone of contention. I have two or three specimens here that I would like to show. Here is one with a 50-cent piece. That child was seen, but disappeared after the x-ray picture was made. It came back in two or three days, still with the half dollar. I asked where they had been, and they said they had been to Dr. So-and-So, and he wanted to operate. I sent them to the hospital and I met this man at the hospital and asked what he had meant to do, and he said he had expected to do a pharyngotomy and take it out.

That is the sort of thing we as specialists must educate the general profession out of. I agree with Dr. Purcell that it is better for the patient to keep the foreign body than to get it into the hands of a man who will cause more injury. Dr. Jackson has cases all the time that have to be rested a week to get over their trauma before he can operate upon them.

This Association should issue propaganda to let the people know that these cases can be treated and these children's lives saved. This subject has a wider field for study, study of diseases of the lungs and esophagus. It should not be confined to foreign bodies.

Dr. A. E. Goodloe, Chattanooga, Tenn.—Dr. Carpenter could have made his paper still more interesting if he had told something of how he removes these foreign bodies, especially the safety pin in the right bronchus that had been there long enough for granulations to take place. There was a pin, with the point up, and granulations around it, in the right bronchus, and he is certainly to be congratulated on having removed it.

He spoke of tracheotomy, but I do not know whether he performs the operation much. I do not believe it is often necessary.

Dr. Arbuckle said he would like to see some one do a suspension without general anesthesia. We can do it in a majority of cases without anesthesia. We do it in children easily, those under three or four years of age, and in very old people in whom the esophagus and larynx are not so sensitive as in younger persons. I have done suspension a number of times without general anesthesia and very easily.

I agree with Dr. Purcell that coins are most easily removed. They are uniform. We know beforehand what we are going after. We know what kind of forceps it will take to remove it, and we know just about where it lies and how it lies. Nearly all of them lie just behind the larynx, and they all lie in the transverse position. It is the irregular bodies, shells, nut hulls, etc., that have become impacted, that are hardest for me to remove.

Dr. Carpenter (closing).—The subject of endoscopy for the removal of foreign bodies from the lungs is now largely an educational problem. I believe the subject should be presented to the Section on General Medicine occasionally in order to keep it informed of the possibilities of this work and to call attention to the large number of unrecognized cases.

The diagnosis of inhalation of stearate of zinc is usually made by the family. The present containers are a dangerous menace to the nursery. The case reported in this series showed no pathology in the lungs and was interesting because of the extensive involvement and the high respiratory rate.

We use suspension in selected cases only.

Some one compared the removal of a foreign body from the bronchi to the removal of a cork from a bottle. The mechanics are identical, but it must be done without trauma. We rarely do a low primary operation, but have observed that cases with retained secretions in the chest with narrowing of the subglottic space or reduced tracheal lumen often show great improvement under increased drainage through a tracheal opening.

MISCELLANEOUS

PRIVATE NURSING HOMES*

By Sydney R. Miller, M.D.,
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INTRODUCTION

For the past six or seven years there have existed in Baltimore several so-called private nursing homes. They have been, in many respects, similar to the well-known rest houses of London and Paris into which private patients enter almost exclusively, since so many of the continental hospitals admit to their wards only the poor and needy. It is altogether probable that similar homes exist elsewhere in this country; if so, little attention has apparently been drawn to their peculiar and special advantages which are important enough to warrant a brief description of them. These nursing homes came into existence as a result of several factors:

(1) The city of Baltimore—one of the world's foremost medical centers—did not then, nor does it today, possess hospital facilities adequate for its indigent sick, much less for the hundreds who come, as to Mecca, from remote corners of the world to be healed. Hospital waiting lists are not infrequently filled for three or four weeks ahead and many who have traveled miles have been forced to return home, untreated, because of their inability to meet the financial loss incurred by an indefinite wait in hotels or boarding houses.

(2) Many of the smaller hospitals particularly are fundamentally surgical in character. That is, surgical patients would seem to have preference over medical patients in entering these hospitals, and their facilities for, but more particularly interest in the care of, certain types of medical patients are notoriously unsatisfactory.

(3) It had long been recognized that there are patients who do not do well in any hospital, or, stated in another way, their cure is unnecessarily protracted and made difficult by reason of certain defects unavoidably inherent in the running of any large institution. In addition to this, there are always patients who fight shy of treatment in hospitals as the result of former unpleasant experiences, obsessional aversions, fear, or a natural antipathy to being in close proximity to the very sick, maimed, or dying.

(4) Finally, to some nurses who had devoted years to special nursing in the private wards of hospitals, and to whom these defects had become apparent, there came a vision of establishing real havens of rest, nursing homes, in which they themselves might attain certain nursing ambitions, where their efforts might be productive of a more rewarding satisfaction, and, not least of all, a substantial income.

GENERAL DESCRIPTION AND ADMINISTRATION

With few exceptions these nursing homes have been large city houses, usually located on a corner, remodeled to suit the needs for which they were intended. Their establishment in the country or suburbs has seemed inexpedient, for their ready accessibility to the physicians who have utilized them has been no small factor in their success. They have been kept purposely small, the largest accommodating twenty patients, the smallest seven. Naturally the size of the rooms, their lighting, ventilation, number of private baths, elevator facilities, etc., have varied much. No attempt has been made to standardize them save in one respect, to make them home-like and as much unlike an institution as possible. An attractive entrance hall and reception room, reminding one most of some one's private home, is the first sight which greets the patient. The rooms have been furnished simply but daintily and in good taste. The hangings and pictures have been selected both to harmonize with the room and the needs of the sick. The rooms are, of course, all connected by an electrical call-bell system either with the nurses' lounging room or the chart room where the records of the patients are kept and orders are written and day and night reports from the nurses are left, just as on the ward of any hospital. Each has its own miniature

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pharmacy, if one may call it such, in which are kept all drugs which are ordinarily used and, of course, those which would be required under conditions of emergency. In all of the homes the diet kitchen has assumed primary importance. It has usually been in charge of a graduate dietitian who presides, not merely over the preparation of the food and special individual diets, but more particularly over the trays and the manner in which the food is served.

The administration of these nursing homes has been extraordinarily simple and in some ways rather unique. All have been started by one or more nurses who have clubbed together and have assumed the entire responsibility for furnishing and financing the home. Their only guarantee of success has been their own enthusiasm in the work and the promise of physicians to send them patients. Obviously this would cease were conditions in the home found to be in any way unfavorable to the welfare of the patients. In no way whatsoever have any interested physicians financed the original enterprise or profited financially through its successful administration. The reasons for this must be obvious. That the homes have been successful from the standpoint of physicians, patients, and nurses is best evidenced by the fact that they have been maintained consistently ever since their inception.

Rates in these homes naturally have varied. In general, the rooms will average from $50 to $60 a week, or more, for the larger rooms with private baths, and as low as $28 a week for care in a room shared with another patient. Each of the homes provides one or more graduate nurses for general utility day duty and at least one for the night. These care for those patients who either do not need or cannot well afford the services of a full-time special nurse. The rates above include practically everything, that is, nursing care by the resident nurses, extra nourishment, and all ordinary medicines which do not have to be especially compounded. Where a patient has a special nurse a charge of $10 a week is made for her board.

TYPE OF PATIENTS ADMITTED

A wide variety of cases has been successfully handled in these nursing homes. None is equipped to meet surgical requirements, none accept, save under unusual circumstances, patients critically ill or suffering from acute infectious diseases. These homes have been found unusually satisfactory in caring for cases where an exact dietetic regime has been of the greatest importance. They have served admirably as places of rest for patients undergoing observational study or functional tests of various sorts demanding accurate supervision; patients with severe anemias, requiring transfusions and others needing specific intravenous and intraspinous therapy have been easily cared for. But above all, these homes have proved their peculiar usefulness in renewing the vitality of feeble people, nervous and exhausted men and women, who are, as a rule, thin and lack blood and psychic stability. Many of these patients have passed in turn through many hands and have been treated in many hospitals for as many troubles. Too often they have remained unchanged, invalids, unable to attend to the duties of life and sources alike of discomfort to themselves and anxiety to others. These are the cases which complain of no endurance, ease of fatiguability, depression, and are convinced of the existence of some malady which foreshadows their dissolution. Their every effort induces complaints pregnant with devastating fears, anxieties and a need for endless tonics. Indigestion and the fear of food, or, more properly, exaggerated food notionalisms, exact their toll of flesh and blood and bring with them irritability, insomnia, introspective self-depreciation and a host of environmental difficulties; in a word, the psychoneurotic. Into the nursing home such a patient passes from a restless irregular life, endless drugging, hurtful sympathy and overzealous care to an atmosphere of quiet, order and control, to the care of a competent nurse, an absence of drugs, and a sensible diet.

ADVANTAGES OF NURSING HOMES

Certain advantages of these small private nursing homes over larger institu-

tions have become more and more manifest. Briefly summarized they are as follows:

(1) Psychoneurotic patients of the milder type react best to home-like surroundings where there are almost all of the advantages of a modern hospital, but none of its disadvantages in terms of odors, unpleasant sounds or incidents, and the unavoidable neglect of minor details which to some patients assumes tremendous importance. In no general hospital, and particularly in hospitals where surgery is the pre-eminent specialty, can one easily establish the degree of disciplinary control so fundamentally needed by these patients.

(2) Their small size in comparison with the relatively large number of deeply interested supervisors makes detailed individual attention more readily possible.

(3) The choice, preparation and serving of food is unquestionably superior to that of most hospitals. The attempt certainly has been made to pay meticulous attention to this phase of the nursing home problem. The best possible cooks are secured and the foods bought are the choicest the market affords. The marketing is done by a person trained to buy, and endowed with the natural critical instincts of the provident housewife. In these homes it is possible to cater to the special dietetic requirements or legitimate whims of each patient with ease and accuracy. Moreover, the psychology of eating for those many patients who have aversions to food, or a lack of appetite, can be more consistently appealed to through the excellent preparation of the food itself and the daintiness of its serving. Fine linen, attractive china, and the finger bowl with a small flower in it will oftentimes lure a digestive system which would rebel against food otherwise served.

(4) In these nursing homes patients live and are treated under conditions of greater privacy, and the absence of the institutional atmosphere goes a long way with some toward convincing them they are not as sick as they have imagined.

(5) A matter of no small importance is the fact that in these homes patients are under the supervision of one physician with the house or special nurse as the only intermediary agent. In all hospitals many difficulties are encountered because the attending physician leaves his patient with one impression; the house resident perhaps with another and the interne, often both inexperienced and unfamiliar with the views already given, may further complicate the patient's viewpoint: finally, the multiplicity of nursing attention finishes the snarl which sometimes literally makes cure for the patient impossible. With psychoneurotic patients it is highly important that everyone having contact with that patient should be working, thinking, and talking along precisely the same lines. This requirement is satisfactorily met, as a rule, in nursing homes.

(6) The very fact that their financial success or disaster depends upon their own efforts makes the nurses in charge of these homes unusually industrious and, if anything, hypercritical, of the behavior and efforts of the special nurses who are called in to care for particular patients.

(7) Nursing in these special homes is easier than in most hospitals. Although the hours of duty are usually the same, the surroundings are more conducive to the avoidance of fatigue and the food served is more appetizing; the house nurse makes it possible for all specials to have an hour or two off in the afternoon during the rest period of the patients, and, most of all, the nurses themselves feel more personally keen to help their patients because of the general *esprit de corps* of the home. One other feature which involves the nursing problem makes for the good of the patient, and it is this: the physician in charge is relying almost exclusively upon the nurses for further helpful information concerning his patient's behavior, individual idiosyncrasies, and so forth. In hospitals many nurses feel that their intuition and their skill are constantly overshadowed, or made little use of because the attending physician so often relies upon the reports of the internes or house officers, who infrequently fail to work as closely with the nurses as might be wise. In nursing homes, the

special nurse is immediately thrown upon her best resources and it is made clear to her that much help is expected from her judgment and her critical observation of her patient. Her feeling then of responsibility is greater and the result is, more enthusiastic and intelligent service.

(8) In these homes the executive and nursing staff can be made more nearly permanent and there is thus a greater ease of contact between the physician and the management: this makes for better treatment of the patient and an easier solution of complaints or criticisms.

DISADVANTAGES

Provided the cases are properly chosen the number of disadvantages of nursing homes are few and unimportant. Some patients have complained because there was no resident physician or interne. There have been very few instances where this has assumed any real importance. If patients for one reason or another turn out to be more seriously ill than had been suspected, it is usually easily possible to transfer them to a hospital. These homes naturally lack the prestige of an internationally known hospital and this to some patients counts for a lot. On the other hand, most patients care little where they are so long as they are comfortable and receiving the personal care and supervision of the particular physician whom they have selected to restore them to health. Located in the city, these homes are naturally subjected to a great deal of city noise and dirt, and most of them are not so situated as to possess desirable outdoor porches. In them, of course, there is not the ready ease of consultation which exists in hospitals. However, most patients enter only after a very careful diagnostic study and all of the homes are within easy reach of the office either of the physician in charge of the case or the specialist to whom he thinks the patient should be referred. Other points of criticism, most of them of a minor nature, are probably self-apparent. None of them, however, has been deterrent to the successful running of the homes and all of the possible objections of course need to be and are considered in the initial decision as to where a particular patient will do best and why.

In conclusion, it is the author's belief that there is a very real need for an extension of this type of institutional care. Nursing homes offer certain advantages in the care of the sick which cannot be over-emphasized. For physicians, they simplify the handling of certain patients very materially. For nurses, particularly those who have had long experience in the hospital care of patients, such homes provide a satisfying type of life in which they can carry out some of the very highest aims of the nursing vocation.

900 St. Paul St.

Discussion follows paper of Mr. White, page 639.

THE UNIVERSITY CAMPUS HOSPITAL*

By Mr. Walker White,
Superintendent, Wesley Memorial Hospital,
Atlanta, Ga.

In beginning this discussion, it may be well to localize the hospital that I must necessarily have in mind because it is the one with which I am connected. It is a hospital of two hundred and twenty-five beds, situated on the campus of Emory University, with which it is affiliated, in a beautiful residence community five and one-half miles from the center of Atlanta. The building is just being completed and will be occupied in about two weeks. What I shall say, therefore, is based upon the thought that has been given to this problem in discussing locating the hospital on the campus rather than upon actual experience gained in its operation.

The university campus hospital finds danger in the fact that too much stress may be laid upon teaching and too little upon the patient. The tendency might be to consider the hospital in the nature of a laboratory and the patient in the nature of laboratory material. Any consideration of hospital problems that does not

*Read before the Southern Hospital Association, Auxiliary of the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

center around the patient will result in wrong thinking and erroneous conclusion. The teaching of nurses, or of medical students, or of internes, or the advancement of science through research work in the laboratories or clinics, are by-products of the great work of the hospital, which is the healing of disease. In the beginning, hospitals were established for the care of the sick. The training of nurses and the development of medical science, valuable as they are to humanity, followed of necessity. Enthusiasm for teaching must not run riot, therefore, and overwhelm the real object for which hospitals were established. I respectfully recommend to all who are interested in hospital work—and I take it that all who are present are interested—the careful consideration of what might be termed the hotel function of the hospital: the idea that those intrusted to our care are guests, as well as patients, and that they and their friends must receive every courtesy that they would receive in a first-class hotel. This fact is each year becoming more important in hospital management.

Believing that it is a correct view, and realizing the fact that the campus hospital may have a tendency in the other direction, we are organizing our hospital on a basis that will center around the patient and the treatment and cure as well as the study of diseases. We shall endeavor to gain the interest and friendship of our patients, and while we cannot say to them that we shall be glad to see them back without laying ourselves open to the charge of being heartless, we can at least make our patients want to come back, if necessary. This problem is one that is not peculiar to hospitals located on campuses. We have greatly overworked the term "psychology," but undoubtedly a patient who has confidence and trust in the hospital, and who is satisfied, is in a psychological state that will give the physician or surgeon a better chance. This will be the contribution of the hospital itself to the members of the medical staff; the placing of the patients in such mental and physical condition and comfort that the attending physician or surgeon shall have a better chance for success.

The campus hospital should offer the best facilities for the instruction of nurses and should attract those best prepared to undertake the study of this profession. The University with which we are affiliated has laboratories, clinics and libraries far better than we could hope otherwise to command. Already many of these facilities are ours for the asking. Whether we use them to advantage depends on the hospital. Consider for a moment what it would cost a hospital to equip such laboratories for the teaching of chemistry, or pathology, or anatomy as you will find in a Class A school of medicine, and you can readily understand what great advantages are offered to the hospital with a university connection. Nor would I overlook the many opportunities for general culture that a university association affords. To the ambitious young woman these things will be most valuable. Of course, the members of the medical faculty will always extend their services in instruction of nurses, but I have assurance that members of other faculties are willing to give of their experience and knowledge to the forwarding of this work. Lectures from distinguished visitors not otherwise procurable will be available for student nurses.

Our entrance requirements are sixteen units, four years of high school work, and perhaps this is a maximum training school requirement. From actual experience with college students having this same preliminary training, I am unwilling that our student nurses shall consider this anything more than a foundation on which to build a more liberal culture. To say that a young woman whose general education closed with four years of high school work is an educated young woman is to use the word "education" in a very restricted sense. With this as a foundation, and with the proper contact with educated people and with books, a young woman may safely consider herself in the way of becoming a person of culture. This opportunity we believe we can offer through our university affiliation. A physician told me recently that he often had difficulty in finding a nurse who would harmonize in a home of culture and re-

finement. A hospital whose nurses can mingle without embarrassment with people who are well informed occupies an enviable position, and certainly a hospital in close contact with a university has opportunity to occupy this position. Because of these advantages, such a hospital has unusual opportunities to train nurses for administrative and executive positions in public health service and with other hospitals. I hope for and confidently look forward to the time when our school shall become so closely identified with the university that those who are qualified will receive the degree of Bachelor of Science in Nursing from the University. Looking further into the future, it is very possible that association with universities for the training of nurses will be considered as necessary as such association for the training of medical students, and that a degree in nursing instead of a certificate will be customary.

What has been said of nurses is equally true of internes. Ambitious young men are undoubtedly attracted by university surroundings. The fellowship with more mature men of experience and scholarship in medicine and liberal arts must be attractive to men seeking to fit themselves for a high standing in their profession. To pursue in a hospital attached to a university what amounts to post-graduate work in the university, and to do this at no expense to themselves, is an advantage not to be lightly regarded by thoughtful men. Other hospitals may offer as much, but with few exceptions they cannot offer the prestige that a university hospital can offer. To have it known that one held an interneship at a hospital attached to a well-known university school of medicine is to gain at once some hold on public confidence.

With these facts in mind, both as regards nurses and internes, I believe that hospitals will come to consider a university connection desirable and to be sought after when available.

In order to get the best results, the location of a hospital on a campus in close proximity to the medical buildings is much to be desired.

It is needless to say that a university campus hospital is a teaching hospital for undergraduates in medicine. The wards will furnish the necessary material. It would appear that the teaching of medicine and surgery would be of benefit to the patient. Presumably, a physician or surgeon always does his best, but I believe that there will be the greatest carefulness on the part of a physician or surgeon when a group of inquiring minds and keen eyes is centered on his work. Thus the patient would be benefited and so would the instructor. Generally, there is no profession that requires more accurate thinking than the profession of teaching, and no man who gives even a part of his life to this profession will fail to be benefited. So, theoretically, teaching undergraduates should be good for the patient, for the instructor, and for the student, and I believe that this is also true in fact.

Hospitals are becoming each day a more important factor in modern civilization. They touch the lives of a larger percentage of our population than even those of us connected with hospitals suppose. You will constantly find people in remote sections who tell you that they, or some member of their families, or some friend have been to your hospital. From the coves of the mountains, from the lonely sections of the thinly settled farming districts, from the alleys of the cities, as well as from the homes of luxury the hospital draws its material. Some of those who enter its doors have never known comfort, and to them the comparative luxury of a hospital is a revelation. To minister to these is a privilege for which we should be thankful, but we have other opportunities for service to humanity, opportunities that exist more largely for the university hospital than for those not having such associations. This opportunity arises from the dissemination of knowledge gained by the medical profession in the treatment of the large number of cases entering the hospital. Such knowledge, when disseminated under the auspices and with the imprint of a university, will receive more respect than if distributed otherwise.

It is our purpose to set a high standard and to open our doors to those of the medical profession who meet this standard. A physician, for instance, who does not look carefully to his records can have no place with us, but to withhold from the profession generally whatever knowledge may come from the opportunities offered by so large a field as the hospital offers would be miserliness, intellectual and professional miserliness. To that end, it is proposed by the medical staff to invite to its open meetings those who do not practice in our hospital, and to ask them to participate in the discussion of such matters as may be brought out in the study of case records. "As iron sharpeneth iron," so will the intellect and the skill of the profession generally be sharpened and tempered by these discussions. If thus an experience of value should be developed and put into written form, this would be given publicity, and I believe, as I have already stated, would be more widely read because it would bear the imprint of an institution which would have in mind only the advancement of science and the good of humanity.

Please do not understand me to say that a good hospital, a Class A hospital, cannot be operated except on a university campus. A university campus hospital, however, has certain advantages and some of these I have endeavored to set forth. Our ideals are in keeping with these advantages, and the administration and professional staffs of our hospital are prepared to do the hard work, intellectual and physical, necessary to crystallize these ideals into results.

DISCUSSION

Papers of Dr. Miller and Mr. White.

Dr. T. Z. Cason, Jacksonville, Fla.—I should like to know if Mr. White has considered the plan of giving the nurses, in the third year, such work as would be applicable for those who wish to take up public health nursing or to do work in doctors' offices, as there is a demand for such service; and further, if he has taken up the problem of an affiliation with the university or girls' college so that the girls may take three years' college work and two years' hospital work. The Riverside Hospital in Jacksonville has affiliated with the Florida State College for Women, and the girls take the domestic science course with two years in college and two years in the hospital and the last year in college, and are then eligible for the state board examination which entitles them to the R.N. and B.S. degrees. We have just started it and wonder what the value of it will be and what it will mean to a large institution such as that which Mr. White directs. Ours is a small hospital, but we are maintaining the same standards of entrance.

We are particularly interested in preparing our nurses to be not just nurses, but to be able and efficient workers.

We are looking to the large institutions to guide us. I am very anxious to have Mr. White's answer.

Dr. L. B. McBrayer, Sanatorium, N. C.—The matter of nurses seems to have grown until it demands at this time very careful study and intelligent handling. In North Carolina we have arrangements both with the State College for Women and the University, which is now co-educational, whereby they offer courses leading to the degree of bachelor of science and a diploma of graduate nurse after three years in college and two years and four months in the training school for nurses. That seems to me to be very wise. I ought to state that the women are not falling over themselves to take advantage of it; perhaps for the reason that the average high school girl in going to the hospital and staying three years can make as much money as the college graduate. That is another thing that this Association, along this same general line that I mentioned in the beginning, should study very carefully.

It seems to me that the quality of women who enter the nursing profession and the success that is made in that particular line of undertaking makes it necessary for us at least to offer the nurses some particular distinction for extraordinary work outside of the regular nursing program. For example, the nurse anesthetist should have a title, for she has come to stay. Some of the doctors are fussed about it, as you know. You take the public health nurses; that is a comparatively new field and the title is well designated, "public health nurse." She is more than the average graduate nurse. She has had a post-graduate course since her graduation and she is called a public health nurse. So I might go on with superintendents of hospitals, head nurses, operating room nurses, and so on. These nurses are specialists in their particular line, and then the private duty nurse who does not want to do very much work may be a specialist. What is to become of the patient? Who is to nurse the sick person? That is the thing we should keep in mind. This Association and the nursing and hospital associations have this problem squarely before them. In Maryland practical nurses are licensed and a similar bill is now before the New York Legislature. We should have a class of people to nurse the sick without so much fuss and feathers. Shall the nursing profession relinquish to the person less well trained all the hard work of the profession? Those are the things that we need to

think about and study a great deal, the things that are pressing for solution at this time.

Dr. Stewart R. Roberts, Atlanta, Ga.—The general practitioners in the smaller towns and rural districts are practically given over to the opinion that there should be a change in the nursing profession, whereby they can get for people not so well situated financially a nurse at lower rates even if less well trained. In my section of the South it has become almost impossible to get trained nurses to go outside the city.

Mr. White (closing).—We are just completing our hospital. We have looked forward to our affiliation with the university, and it has been virtually promised us. We are located on the campus in close approximation to the university buildings. They have under way a plan for organizing a woman's college. Emory University is not coeducational. They are organizing a woman's college, of which the first school is to be the School of Education. It is thought that when this is done the hospital should be linked up with that school and the work done in the School of Education. In anticipation of that we have required the same entrance units, so that when the time comes those who desire may continue this work. The girl with only a high school education will not receive the same course as the one with a college education. It will be necessary for them to do some other work in college, either in a college of liberal arts or a woman's college. That is what we are looking for.

The system of the university regarding its schools is this: A man applying for the School of Medicine, if he has completed his four years of work, takes two years pre-medical work in the university. At the end of those two years he gets a B. S. degree, and at the end of the next two years the M.D. degree. We plan to work out such a system for the nurses in the School of Education, and then before or after completing the hospital course they will take a certain amount of work in Emory University before getting a degree.

Another point was the matter of compensation of nurses. You have struck a very vital point. The more you require in the way of preliminary training and college training on the part of young women, the more you have to pay them. You can get a girl out of high school, and with three years' hospital work she does not expect the same compensation and does not look for the same things in life that a woman does who has been through college. Maybe the girl with this preliminary education is better than the other. There has been a good deal of discussion on this subject. Some think that every nurse should get the same salary. I see only one thing as far as the small town is concerned—that is, that nurses might supervise the nursing in the home and charge so much per hour for their services. It is a very important question, and I am very glad to hear the men in the medical profession who are interested in the problem.

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DR. M. Y. DABNEY, Editor
C. P. LORANZ, Secretary-Manager

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Seventeenth Annual Meeting, Washington, D. C.
November 12-15, 1923

ESTABLISHMENT OF AN ADEQUATE FLOW OF BREAST MILK

The slogan of the modern pediatrician is "back to the breast." Articles dealing with the technic of nursing and of establishing an adequate supply of breast milk for the infant are as prominent in the literature now as were detailed descriptions of formula feeding in the past decade.

A noteworthy piece of work upon breast feeding of the last few years was done by Dr. J. P. Sedgwick,* of the University of Minnesota, who started out with the hypothesis that every woman can nurse her baby. The most important factor in this, he brings out, is complete and consistent evacuation of the breast at each nursing. This can best be done by a vigorous baby who is placed at the breast at regular intervals. If the infant is not strong enough to empty the breast, the breast should be stimulated by artificial expression of the milk, by one who understands the technic. It can easily be taught to the mother, but very few physicians or nurses themselves understand the correct way to empty the breast. The usual mistake is to massage the fleshy part of the breast, which is about as logical as attempting to milk a cow by squeezing her udder. Pumps and the ordinary methods of manipulation do more harm than good. The breast should be grasped between the forefinger and thumb just back of the colored areola. The finger and thumb are pressed together toward the nipple with a stripping motion.

The first few days or weeks of a baby's life are of the greatest importance in establishing its food supply. If the mother is told always that she can nurse the baby rather than that she is too nervous or has not enough milk, and if she is then shown how to stimulate her breasts to produce sufficient milk, a great deal of trouble with rickets, malnutrition and infant digestive troubles may be avoided. This is a responsibility which falls upon the obstetrician and the general practitioner even more often than upon the pediatrician who may not see the infant till it has been weaned and is in trouble.

*Sedgwick, J. P.: Am. J. Dis. Children, May, 1921.

PUERPERAL INFECTION

Puerperal infection, avowedly a preventable disease, still confronts any physician with an extensive obstetrical practice, and frequently occurs in unexpected cases. It is a baffling thing and one that is always a source of annoyance and won-

der to the obstetrician that certain labor cases in which there is extensive interference with very doubtful asepsis pass through an afebrile puerperium, while others in the hands of good obstetricians in clean surroundings develop an extreme septic infection. These exceptional cases, of course, form no argument against aseptic technic.

Modern diagnostic measures are of little avail in determining the source of infection in these obscure cases. There may be apparently no focus in the body, and conditions about the generative tract may show no special avenue of entrance. In such a case one would think that an examination of the lochia taken with care from the inside of the uterus and a culture of the blood would aid in the making of a definite diagnosis, but unfortunately this is not the case.

Streptococci are found in the discharges of cases that are entirely without fever. Their presence does not prove that they are causing the symptoms. Examination of the lochia should be made and it is perhaps of greatest value if the gonococcus or the colon bacillus can be clearly demonstrated as the infecting agent, for then administration of vaccine from cultures of the organisms will prove rational therapy.

Examination and culture of blood taken from cases that give evidence of extreme sepsis are disappointing, for they rarely show the presence of streptococci. It is claimed that quite a number of specimens must be examined at various times before they can be definitely demonstrated in the blood, which is costly and impractical for most physicians.

It is best in all puerperal cases with fever where the lochial discharge does not show a distinct preponderance of gonococci or colon bacilli, and no other explanation for the rise in temperature can be found, to assume that one is confronted with a streptococcic infection.

An old-time remedial measure is again being advocated by some in the treatment of this condition. A fixation abscess* produced by injecting 1 to 2 mils of turpentine into the muscles of the thigh in some favorable cases is said to provoke a systemic resistance to the infection.

The abscess, when once formed, must not be evacuated until all symptoms of puerperal infection have subsided. It is of peculiar significance that in apparently hopeless cases no abscess formation takes place. For this reason it is recommended that the fixation abscess be used early in the treatment of the condition, if it is to be used at all.

HOTEL ACCOMMODATIONS FOR WASHINGTON MEETING

The following information has just been supplied by the Committee in charge of the Washington meeting of the Southern Medical Association which is to be held November 12-15. Washington, it must be remembered, is famous for its hostelries, and can accommodate conventions of any size.

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*Santi, Emelio: Annals of Obst. and Gyn., January, 1923.

The hotel headquarters are:

NEW WILLARD HOTEL
General Hotel Headquarters
Section on Medicine
Southern Gastro-Enterological Association
Section on Pathology
Conference on Medical Education

WASHINGTON HOTEL
Section on Pediatrics
Section on Obstetrics
Section on Eye, Ear, Nose and Throat
Section on Radiology
Section on Dermatology and Syphilology

RALEIGH HOTEL
Section on Surgery
Southern States Association of Railway Surgeons
Section on Bone and Joint Surgery

SHOREHAM HOTEL
Section on Urology
Section on Neurology and Psychiatry

NEW EBBITT HOTEL
Section on Public Health
National Malaria Committee

BURLINGTON HOTEL
Southern Association of Anesthetists

For the early bird who wishes to engage rooms in advance, the Hotel Committee furnishes the following information regarding Washington hotels:

New Willard Hotel, 14th St. and Pennsylvania Ave.
Single, without bath, $3; double, $5
Single, with bath, $5, $6, $7; double, $7, $8, $9

Washington Hotel, 15th St. and Pennsylvania Ave.
Single, with bath, $5, $6, $7; double, $8, $10, $12

Raleigh Hotel, 12th St. and Pennsylvania Ave.
Single, without bath, $3, $4; double, $4, $5, $6
Single, with bath, $4, $5, $6, $7; double, $5, $6, $7, $8

Shoreham Hotel, 15th and H Sts.
Single, without bath, $3, $4; double, $6
Single, with bath, $5, $6, $7; double, $7, $8, $10

New Ebbitt Hotel, 14th and F Sts.
Single, without bath, $2.50; double, $4
Single, with bath, $3.50; double, $6

Burlington Hotel, 1120 Vermont Ave.
Single, with bath, $3.50, $4, $4.50; double $5, $6, $7

Arlington Hotel, 1025 Vermont Ave.
Single, with bath, $5, $6; double, $7, $8

Franklin Square Hotel, 14th and K Sts.
Single, without bath, $2.50; double, $4
Single, with bath, $4; double, $5, $6

Gordon Hotel, 16th and I Sts.
Single, without bath, $3; double, $5
Single, with bath, $5; double, $7

Harrington Hotel, 11th and E Sts.
Single, without bath, $3; double, $4
Single, with bath, $4; double, $5, $6, $7

Hamilton Hotel, 14th and K Sts.
Single, with bath, $5, $6; double, $7, $8

Lafayette Hotel, 16th and I Sts.
Single, with bath, $4, $5; double, $6, $7, $8

Lee Hotel, 15th and L Sts.
Single, with bath, $4, $5, $6; double, $6, $7, $8

Martinique Hotel, 16th and M Sts.
Single, with bath, $4, $5; double, $7, $8

Powhatan Hotel, 18th St. and Pennsylvania Ave.
Single, without bath, $3, $3.50; double, $5
Single, with bath, $4, $4.50, $5; double, $5.50, $6, $7, $8

Book Reviews

Text-Book of Ophthalmology. By Hofrat Ernst Fuchs, former Professor of Ophthalmology in the University of Vienna. Authorized Translation from the Twelfth German Edition; Completely Revised and Reset, With Numerous Additions Specially Supplied by the Author and Otherwise Much Enlarged. By Alexander Duane, M.D., Surgeon Emeritus, Knapp Memorial Hospital, New York. With Four Hundred and Fifty-five Illustrations. Seventh Edition, Revised and Reset. Philadelphia and London: J. B. Lippincott Company.

The book has been entirely rewritten and rearranged. In the rearrangement the attempt has been made to follow a logical order so that the relations between the separate parts of the subject shall be made most clear. In the text changes made, the translator has had the benefit of consultation with Dr. Fuchs and of comparison with the thoroughly revised thirteenth German edition just prepared by Professor Salzmann.

The translator assumes the responsibility for the very numerous changes made—changes which are found on practically every page. These include, first, changes in the sections on the anatomy of the eye, which are now grouped together so as to form the initial part of the book. The succeeding portions on the development and physiology of the eye have also received considerable additions and changes.

Among the subjects added in these special parts of the book are: Gullstrand's observations on the character of the images in astigmatism and the structure of the lens, the cardinal points of lenses and the eye, a new table of accommodation, the evolution of ametropia, and a more extended consideration of the determination and treatment of refractive errors. In the part treating of special diseases almost every page has been revised.

The part on operations has also been largely revised, the specific additions comprising, among others, Francis' method of removing superficial tumors, Wheeler's operation for a new socket and for blepharoplasty, a variety of the other plastic operations on the lids, some of the newer operations for keratoconus and staphyloma, a much fuller description of trephining, the indications for the glaucoma operations, sclerectomy for detachment, fuller description of the Reese resection, Wootton's advancement, the indications for muscle operations, and fuller descriptions of the substitutes for enucleation. A number of new illustrations have been added.

With all these changes the attempt has been made throughout to preserve the spirit and wherever possible the words of Dr. Fuchs, whose genius gave the work an impress quite unique and whose unerring judgment make it remarkable alike for the breadth and depth of its information and for the balance and co-ordination of its separate parts.

The Medical Clinics of North America, March, 1923. Vol. 6, No. 5. Ann Arbor Number. Published Bi-Monthly. Philadelphia and London: W. B. Saunders Co. Paper, $12.00 per year.

Such a great variety of subjects is presented in this number that it is difficult to single out any particular one for special mention. These clinics, from a famous medical center, are in keeping with the high standard set by the editor.

Practical Morbid Histology. A Handbook for the Use of Students and Practitioners. By Robert Donaldson, M.A., M.D., Ch.B. (Ed.), F.R.C.S.E., D.P.H., Lecturer in Pathology and Forensic Medicine, St. George's Hospital Medical School (University of London); Pathologist and Curator of Museum, St. George's Hospital, London. With Foreword by Sir Humphry Robleston, K.C.B., M.D., President of the Royal College of Physicians. 364 pages. London: William Heinemann, Ltd., 1923. Cloth, 15c.

The author in his preface states that the purpose of the book is to give the beginner in morbid histology a laboratory manual and that it can also be of service to the practitioner who is reviewing for examinations.

It is intended more specifically to help the student in studying sections in morbid histology.

There is a brief description of the gross pathology in each section. All illustrations have purposely been omitted, so that the student must study his sections rather than pictures in a book.

For the purpose for which it was written the book is quite satisfactory.

Diseases of the Skin. A Manual for Students and Practitioners. By Robert W. MacKenna, M.A., M.D., B.Ch. (Edin.); Honorary Dermatologist, Children's Convalescent Home, West Kirby; Formerly Hon. Dermatologist and Medical Officer in Charge of the V. D. Dept., David Lewis Northern Hospital, Liverpool; Formerly Capt., R.A.M.C.; Dermatologist, First Western Hospital, and the 57th Gen. Hosp. B. E. F. New York City: William Wood & Co., 1923.

When using pastes on subsidiary inflammatory areas, spread them on wet lint or muslin before applying; by this device the application becomes soothing and gratifying.

The method of applying lotio alba (in acne) is important: After thorough washing with soap and water, dry the face, and dab well with the lotion; allow to evaporate, and then briskly rub the deposited powder into the skin.

Resorcin stains in the presence of alkalis; if the hair is light, never use soap while it is being applied.

Hundreds of suggestions like the above (here paraphrased to save space) are the outstanding recommendation of MacKenna's volume. Throughout the author, who is a born teacher, scorns those non-committal words, exhibit, employ, use, apply, etc., which, unqualified, are too often the despair of the physician who goes to look for specific therapeutic advice in a text on the skin.

The Form and Functions of the Central Nervous System. An Introduction to the Study of Nervous Diseases. By Frederick Tilney, M.D., Ph.D., Professor of Neurology, Columbia University; Attending Neurologist, Presbyterian Hospital, New York Neurological Institute; Consulting Neurologist, Roosevelt Hospital, New York. And Henry Alsop Riley, A.M., M.D., Associate in Surgery, Columbia University; Associate Attending Neurologist, New York Neurological Institute; Attending Physician, Neurological Department, Vanderbilt Clinic, New York. Foreword by George S. Huntington, Sc.D., M.D., Professor of Anatomy, Columbia University. Second Edition. 591 pages, containing 763 illustrations, of which 56 are colored. 1019 pages. New York: Paul B. Hoeber, 1923. Cloth, $12.00.

The authors have taken the stand that the reason diseases of the nervous system are such a closed book to the average student and physician, is that they are not familiar with the anatomy of the nervous system, and hence cannot understand what pathological processes cause certain symptoms.

The nervous system is divided for study into the cerebrospinal axis and the sympathetic system, both of which are described unusually clearly.

The subject is presented in a manner that can be read with profit by both the physician and student. It is seldom that a book is written which has an appeal both to the student and specialist, but this is true of the present volume.

Bacteriology. A Study of Microorganisms and Their Relation to Human Welfare. Discussing the History of Bacteriology, the Nature of Microorganisms, and Their Significance in Connection with Pathology, Hygiene, Agriculture and the Industries. By H. W. Conn, Ph.D., Formerly Professor of Biology, Wesleyan University, and Bacteriologist of the State Board of Health, Connecticut. And Harold J. Conn, Ph D., Soil Bacteriologist, New York Agriculture Experimental Station. 48 text figures and 441 pages. Baltimore: Williams & Wilkins Co., 1923. Cloth, $4.00.

The book is written to supply a want which the authors felt was present in primary instruction in bacteriology. It goes into the historical side of the subject in great detail. It is a bacteriology intended for the undergraduate and not for the medical student or physician.

It takes up bacteriology from the point of view of preventive medicine. Cultural methods are not gone into for the identification of organisms, but there is an appendix on the preparation of media on bacteriological technic. As a text book supplemented by lectures it should be of real use in colleges.

The Heart in Modern Practice. Diagnosis and Treatment. By William Duncan Reid, A.B., M.D., Chief of Heart Clinic, Boston Dispensary; Junior Visiting Physician and Member of the Heart Service, Boston City Hospital; Formerly Assistant Visiting Physician, Out-Patients, Massachusetts General Hospital. 52 illustrations. 352 pages. Philadelphia and London: J. B. Lippincott Co., 1923. Cloth, $5.00.

This book goes into the anatomical, physiological and clinical side of cardiac disease in great detail. The author's classification of heart disease in chapter six is especially useful.

The book is ably written and the material well arranged.

Infection and Resistance. An exposition of the Biological Phenomena Underlying the Occurrence of Infections and the Recovery of the Animal Body from Infectious Disease, with a Consideration of the Principles Underlying Specific Diagnosis and Therapeutic Measures. By Hans Zinsser, M.D., Professor of Bacteriology and Immunity, Medical School, Harvard University; Formerly Professor of Bacteriology, College of Physicians and Surgeons, Columbia University, and Bacteriologist, Presbyterian Hospital, New York; Formerly Professor of Bacteriology and Immunity, Stanford University, California; Colonel Medical Officers' Reserve Corps, U.S.A. Third Edition, Revised and Reset. 32 text figures and 666 pages. New York: The Macmillan Company, 1923.

This book has established a place for itself through its former editions. The present edition has been fully revised and the section devoted to anaphylaxis and the final section on practical therapeutic methods have been enlarged and rewritten.

It is a book primarily for the student, but it can be studied to advantage by any physician wishing to keep abreast of the subject.

A Text Book of Therapeutics. Including the Essentials of Pharmacology and Materia Medica. By A. A. Stevens, A.M., M.D., Professor Applied Therapeutics, University of Pennsylvania; Professor of Therapeutics and Clinical Medicine, Woman's Medical College of Pennsylvania; Visiting Physician, University and the Philadelphia General Hospitals. Sixth Edition. 793 pages. Philadelphia and London: W. B. Saunders Co., 1923. Cloth, $6.25.

The present edition has been extensively revised and entirely reset.

This book has long been popular with the medical student because of the direct manner in which directions are given and the brief but clear way in which it is written.

This sixth edition, like the first, is offered as a practical presentation of the subject and can be followed as a safe guide.

It seems strange that a book written in April, 1923, should dismiss the question of the use of insulin in diabetes in eight lines.

The use of quinidin in atrial fibrillation is well described.

The Anatomy and Physiology of Capillaries. By August Krogh, Ph.D., LL.D., Professor of Zoo-Physiology, Copenhagen University. With 276 pages, illustrated. New Haven: Yale University Press. London: Humphrey Milford, Oxford University Press, 1922.

Physics and chemistry owe their recent rapid strides forward to the advance in the use of quantitative methods. The more empirical sciences of physiology and anatomy are more and more employing similiar quantitative studies. An exact knowledge of the activity of the capillaries will do a great deal toward elucidating the problems of the circulation in general. Dr. Krogh discusses the distribution and number of capillaries in selected organs, their independent contractility, their structure, innervation, reaction to stimuli, their hormonal control, the exchange of substances through the walls, and some applications of the study of the physiology to problems of health and disease.

The Unadjusted Girl, with Cases and Standpoint for Behavior Analysis. By William I. Thomas. Foreword by Mrs. W. F. Dummer. Criminal Science Monograph No. 4. Supplement to the Journal of the American Institute of Criminal Law and Criminology. With 260 pages. Boston: Little, Brown & Co., 1923. Cloth, $3.00.

This is a careful study of the delinquent girl in various parts of the world, the factors that lead to her delinquency, and methods of treatment of her according to the humanitarian principles of the modern sociological thinkers.

Diseases of the Gums and Oral Mucous Membrane. By Sir Kenneth Doadby, K.B.E., M.R.C.S., L.R.C.P., D.P.H. (Cantab.), Lecturer on Bacteriology of the Mouth, Dental Department, University College Hospital; Specialist Medical Referee for Industrial Poisoning, London District (Home Office); Late Bacteriological Specialist, Royal Herbert Hospital, Woolwich; Erasmus Wilson Lecturer, Royal College of Surgeons, 1907; Hunterian Professor, Royal College of Surgeons, 1911. With 383 pages, illustrated. London: Henry Frowde and Hodder & Stoughton, The Lancet Building, 1923.

Since infections of the oral cavity are assuming increasing importance in the diagnosis and treatment of various conditions, it is well for the general practitioner to have some idea of their extent and variety. The book should be carefully studied by dentists, for it is a splendid presentation of the subject.

Dreads and Besetting Fears, Including States of Anxiety, Their Causes and Cures. By Tom A. Williams, M.B., C.M., Membre Correspondant Etranger de la Societe de Neurologie de Paris; Membro Correspondente Academia Nacional de Medicina do Rio de Janeiro, etc; and Neurologist to Freedman's Hospital. Mind and Health Series, edited by H. Addington Bruce, A.M. With 215 pages. Boston: Little, Brown & Co., 1923. Cloth, $1.75.

The practical application in therapy of the principles of modern experimental psychology is shown in this volume by a well-known member of the Southern Medical Association. Its style is easy, its print large, and it is well worth the careful attention of the physician. It could be read with pleasure and profit by the intelligent layman as well.

Heliotherapy. By A. Rollier, M.D., Medical Director of the Institutions for Heliotherapy, Leysin; Laureate of Academy of Medicine, Paris; Correspondent Member of Societies of Medicine and Pediatrics, Paris. With the Collaboration of A. Rosselet, D.Sc., M.D., Lecturer on Physiotherapy, Geneva University; Formerly Assistant at Rollier's Institutions, Leysin; and H. J. Schmid, M.D., Radiologist at Rollier's Institutions, Leysin. With Forewords by Sir John Henry Gauvain, M.A., M.R.C.S., L.R.C.P., and Caleg Williams Saleeby, M.D., F.R.S. With 287 pages, illustrated. London: Henry Frowde and Hodder & Stoughton, The Lancet Building, 1923.

In these days of radical operations, high voltage x-ray tubes, and pluriglandular extracts, it is soothing to read a scientific discussion of the value of so natural an agent of healing as sunlight. Dr. Rollier's work is well known. His case reports extend over many years, and his discussion of the physical and chemical basis of heliotherapy is here well written.

A Key to the Electrocardiogram. By Louis Faugeres Bishop, M.A., M.D., Sc.D., F.A.C.D., Professor of the Heart and Circulatory Diseases, Fordham University; School of Medicine, New York City; Consulting Cardiologist, Lincoln Hospital; Author of "Arteriosclerosis," "Heart Disease, Blood Pressure and the Nanheim Treatment," and "Heart Troubles, Their Prevention and Relief." With 42 text figures and 96 pages. New York: William Wood & Co., 1923. Cloth, $3.00.

The author has attempted in the present volume to stimulate a more general interest in electrocardiography. He has presented his subject in a narrative style, which is very pleasing to read. The book is written with the idea of showing the practical advantages to the patient and physician of electrocardiographic examinations. The subject matter is clearly presented and the reader is advanced step by step, so that when the book is completed he will have a basic idea of the subject and will be able to follow descriptions of cardiac conditions illustrated by electrocardiographic records.

The whole work is carefully constructed, and points of controversy are purposely omitted. The chapter on installation of the galvanometer and its technic of operation are very clear. It is noticeable that there is no mention of the "circus movement" under atrial flutter and atrial fibrillation.

Other Books Received

Pocket Cyclopedia of Nursing. Edited by R. J. Scott, M.A., B.C.L., M.D., New York, Fellow of the New York Academy of Medicine; Formerly Attending Physician to the Demilt Dispensary; Formerly Attending Physician to the Bellevue Dispensary; Editor of "Witthaus' Textbook of Chemistry," "Hughes' Practice of Medicine," "The Practitioner's Medical Dictionary," Gould and Pyle's "Cyclopedia of Medicine and Surgery," etc. New York: The Macmillan Co., 1923.

Venereal Disease in the American Expeditionary Forces. By George Walker, M.D., Late Colonel, Medical Corps, U.S.A., 236 pages. Baltimore: Medical Standard Book Co., 1922.

The Psychology of Power. By Capt. J. A. Hadfield, M.A. (Oxon.), M.B. (Edin.), Ashhurst Neurological War Hospital, Oxford, with 54 pages. New York: The Macmillan Co., 1923.

An Index to General Practice. By A. Campbell Stark, M.D. and B.S. (Lond.), L.S.A. (Eng. X Ph.C.), Exhibitioner and Gold Medallist of the University of London; Gold Medallist of the Society of Apothecaries; Late Lecturer on Biology at Westminster Hospital Medical School; Late Demonstrator on Materia Medica at St. George's Hospital Medical School; Late Surgeon to the Wanstead Park Military Hospital; Author of "Practical Pharmacy for Medical Students," etc., etc. With 180 pages. New York: William Wood & Co., 1923. Cloth, $2.00.

A Text-Book on Minor Surgery. By John C. Vaughan, M.D., Director and Visiting Surgeon, Beekman Street Hospital; Visiting Surgeon, Sing Sing Prison Hospital; Consulting Surgeon, Manhattan Eye and Ear Hospital; Consulting Surgeon, Workers' Health Bureau; Former Visiting Surgeon, Bellevue Hospital, and Chief Vanderbilt Surgical Clinic and Instructor in Minor Surgery, Columbia Medical College. And Athel Campbell Burnham, M. D., Colonel in U.S. Army; in Charge of the Medical Department of Red Cross in Poland; Attending Surgeon, Volunteer Hospital; Former Attending Surgeon, Department of Surgery, Vanderbilt Clinic, College of Physicians and Surgeons; Former Instructor in Surgery in the Polyclinic Hospital. With 627 pages, illustrated with 459 engravings. Philadelphia and New York: Lea & Febiger, 1922.

Rest and Other Things. A Little Book of Plain Talks on Tuberculosis Problems. By Allen K. Krause, A.M., M.D., Associate Professor of Medicine, Johns Hopkins University; Director Dows Tuberculosis Research Fund, Johns Hopkins University; Physician-in-Charge, Phipps Tuberculosis Dispensary, Johns Hopkins Hospital; Lecturer, Trudeau School of Tuberculosis; Editor, American Review of Tuberculosis. With 159 pages. Baltimore: Williams & Wilkins Co., 1923. Cloth, $1.50.

Public Relief of Sickness. By Gerald Morgan. 195 pages. New York: The Macmillan Co., 1922.

"Suggestion" and Common Sense. By R. Allan Bennett, M. D. (Lond.), M.R.C.P., Torbay Hospital, Torquay; Author of "Plain Rules for the Use of Tuberculin." With 105 pages. New York: William Wood & Co., 1922. Cloth, $2.25.

Southern Medical News

BLOOD PRESSURE NUMBER

The June issue of American Medicine (18 East 41st Street, New York) is a special "Blood Pressure Number" and contains twenty-six original contributions on the subject by some of the leading medical men of Great Britain, Canada and the United States, together with abstracts of much of the recent literature and current comments.

ALABAMA

One of the new buildings of the University of Alabama School of Medicine, removed two years ago from Mobile to Tuscaloosa, will be named after Josiah Clark Nott, founder of the Medical College of Alabama, Mobile, 1859.

At the graduating exercises of the University of Alabama School of Medicine, Tuscaloosa, it was announced that the Gorgas School of Sanitation will be established at the College as soon as funds are available.

Dr. Percy I. Hopkins, Dothan, has recently completed a two-story brick and concrete building. The lower floors will be used for stores, while the upper floor will be occupied by physicians and dentists.

At a recent meeting of the Alabama Power Company's Association the following officers were elected: Dr. J. P. Stewart, Gadsden, President; Dr. Frank L. Chenault, Albany, Vice-President; Dr. Connelly, Tuskegee, Secretary-Treasurer. The Association is made up of the physicians and surgeons who have been designated as representatives of the power company.

Deaths

Dr. Walter Steele McCown, New Market, aged 53, died June 18 at the City Hospital, Huntsville, of septicemia, following the extraction of a tooth.

Dr. William Eli Kay, Tuscaloosa, aged 45, died May 4.

Dr. Timothy DeWitt Warren, East Tallassee, aged 35, died June 9.

ARKANSAS

The State Board of Medical Examiners held a reorganization meeting at Little Rock June 12. The following officers were elected: Dr. William H. Toland, Nashville, President; Dr. Thomas H. A. Ross, Arkadelphia, Vice-President; Dr. James W. Walker, Fayetteville, Secretary; Dr. John T. Palmer, Pine Bluff, Treasurer.

Dr. William M. Bevis, Past Assistant Surgeon, U. S. Veterans' Hospital No. 78, North Little Rock, has been appointed Medical Director of the Waverley Sanatorium,

Columbia, S. C., to succeed Acting Director Dr. Connie M. Guion, who has returned to her practice in New York, N. Y.

Dr. Paul Leo Mahoney, Little Rock, has had conferred upon him the degree of Master of Arts by the Little Rock College.

Deaths

Dr. Arthur U. Williams, Hot Springs, aged 69, died May 21 from heart disease.

Dr. George W. Hart, Hindsville, died April 13.

Dr. Henry M. Owen, Newport, aged 67, died June 20.

Dr. John McGinty, Fort Smith, aged 62, died May 27.

DISTRICT OF COLUMBIA

Dr. Sofie A. Nordhoff-Jung, Washington, has founded an annual prize of $500 bearing the title of "The Sofie A. Nordhoff-Jung Cancer Research Prize." This prize is for the encouragement of research in the etiology, prevention and treatment of cancer, and will be granted for the first time in December of this year.

The next course in Physiotherapy will be given at Walter Reed General Hospital, Washington, beginning October 5, 1923, and continuing through a period of four months. It is open to women who have had at least two years of training in an approved school of physical education.

The University of Maryland Alumni headquarters for the Washington meeting of the Southern Medical Association will be the Raleigh Hotel.

Dr. George M. Kober, Dean of Georgetown University School of Medicine, Washington, for the last thirty-two years, received the degree of Doctor of Letters at the recent annual commencement exercises.

Dr. Harry Baldwin Gantt, Jr., Captain, M.C., U. S. Army, and Mrs. Florelle Edson McKie, both of Washington, were married June 2.

On June 7-8 commemoration exercises in honor of the fifty years of service of Dr. Daniel Smith Lamb in Howard University School of Medicine, Washington, were held in the Rankin Memorial Chapel. The honorary degree of Doctor of Science was conferred on Dr. Lamb, who is Professor of Anatomy at the University.

Deaths

Dr. William Gage Erving, Washington. aged 46, died May 13 at Gravenhurst, Ontario, Canada.

FLORIDA

Marion County Medical Society on May 25 formally dedicated a tablet at the Marion County Hospital, Ocala, erected in memory of five members of the Society who had died. They are Drs. S. Potts Eagleton, W. H. Powers, John M. Thompson, William V. Newson and Erastus Van Hood.

The new building to be erected at the Pine Ridge Hospital, West Palm Beach, will cost $36,000 and will be for the exclusive use of negro patients.

Dr. W. H. Spiers announces the opening of the Seminole Sanitarium and Psychopathic Hospital at Orlando for diagnosis and treatment of nervous and mental diseases and treatment of drug and alcoholic habituates.

Dr. Jesse R. Harris, Lieutenant-Colonel, M.C., U. S. Army, retired, recently resigned as Health Officer of Tampa.

With the assistance of the State Board of Health, twenty-four counties in the State during the past year maintained health departments, the total expenditures of which amounted to $214,831.

Deaths

Dr Franklin Pierce Hoover, Jacksonville, aged 61, died April 22 from angina pectoris.

Dr. Levi Joseph Jenkins, Whitney, aged 60, died May 17.

GEORGIA

At the spring meeting of the Seventh District Medical Society, held in Cedartown, Dr. Everard H. Richardson, Cedartown, was elected President; Dr. R. E. Wilson, Cartersville, Vice-President; and Dr. M. M. McCord, Rome, Secretary-Treasurer. The fall meeting will be held in Cartersville September 26.

The Pediatric Section of the Fulton County Medical Society was recently organized. Dr. W. N. Adkins is Chairman; Dr. Hines Roberts, Secretary.

Laurens County Medical Society has elected Dr. J. W.

(Continued on page 34)

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

DEAFNESS IN LATE CONGENITAL SYPHILIS*†

BY ALBERT KEIDEL, M.D.,
and
JAROLD E. KEMP, M.D.,
Baltimore, Md.

Although congenital syphilis was reported as early as 1529,[1] it was not until the middle of the Nineteenth Century that involvement of the eighth nerve was noted as one of its manifestations. In 1853, a non-suppurative form of deafness in children, accompanied by eye lesions, was described by Wilde,[2] but was thought by him to be due to scrofula. Within the next few years several authors reported a few instances of this type of deafness and correctly ascribed it to congenital syphilis. In 1863, a considerable series of twenty-one instances of deafness associated with congenital syphilis, in which the lesion was an affection of the bony or membranous labyrinth, were reported by Hutchinson.[3] He not only attributed the affection to the syphilitic process, but regarded it as characteristically an affection of the inner ear and one prone to appear late in the course of the disease. In this country, Turnbull,[4] in 1888, reported cases identical with those of Hutchinson and commented on the relative infrequency of this form of deafness in this country as compared with its incidence in Europe. The total number of cases reported in the literature up to 1907 was only 93, including those recorded by Poupelain,[5] who incorporated this total in a thesis covering the subject, with a complete review of the literature, which then contained 75 communications. Since 1907 this subject has not received the attention it merits. This is more especially true when one observes the desultory manner in which these patients have been studied.

Adopting a classification described by West,[6] we have studied in this series only those patients who are obviously the subjects of congenital syphilis, and who have become deaf as a result of this disease late in childhood or during early adult life. Patients with a similar symptom complex resulting from extension of an otitis media suppurativa, or secondary to involvement of the nasopharynx, are not here included. Patients with changes in the auditory apparatus present at birth are also not included, as these either die early, or, if they survive, become deaf mutes. Only two such cases have been discovered in our clinic.

The type of deafness which we wish to present is characterized by an onset which may be gradual or abrupt. The patients are usually at or about the age of puberty when the deafness first appears and in most instances they present other unmis-

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*From the Syphilis Department of the Medical Clinic, Johns Hopkins Hospital. This clinical research has been aided by grants from the United States Interdepartmental Social Hygiene Board and from the American Social Hygiene Association.

†Read in Section on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

takable manifestations or stigmata of congenital syphilis. An antecedent interstitial keratitis is frequently noted in the anamnesis. Deafness may be complete or partial, but is always bilateral, although one ear is often affected to a greater degree than the other. Equilibration is rarely disturbed, and vomiting is unusual, although at the onset there may be tinnitus and occasionally nausea. The entire process may be a painless one.

The material from which these cases were selected consists of 230 patients with congenital syphilis seen in the Syphilis Clinic of the Johns Hopkins Hospital during the past six years. In this entire group there is a slight predominance of females over males and a marked predominance of whites over blacks. In this group of congenital syphilitics there were two instances of deaf-mutism, one of deafness due to extension of a gummatous condition in the nasopharynx, and 22 instances of late neuro-deafness, of the type just described. Late neuro-deafness, therefore, was found in approximately 10 per cent of the whole group.

A study of the race and sex incidence shows that in this clinic negro males are the most susceptible. In the order of susceptibility the negro male (12.5 per cent) is followed by the white male (10.6 per cent), the negro females (9.6 per cent) and the white female (7.5 per cent). The incidence for the negroes of both sexes (10.7 per cent) is higher than that of the whites (8.8 per cent), and that of the males of both races (11.2 per cent) is higher than that of the females (8.3 per cent). In these figures we disagree sharply with practically all other writers on this subject, particularly in that we find the susceptibility of males to be higher than that of females. Our 22 cases are divided equally between males and females, but in the whole group of congenitally syphilitic individuals there are four females for every three males.

The age of the patient at the time of onset is one of the striking features of the malady. In our series the extremes were 7 and 27 years. Dividing the interval of 20 years between these extremes into two periods of six years each and one of 9 years, we find that between the 7th and 12th years there are 6 cases, or 28.5 per cent; between the 13th and 18th years, 10 cases, or 47.6 per cent; and between the 19th and 27th years 6 cases, or 28.5 per cent. In other words, almost half of the patients are within the age limits of 13 to 18 years, the curve reaching its height between the 13th and 14th years. This is in exact accord with the observations of others, who universally place the age at onset as close to that of puberty.

The character of the onset was noted in 18 cases. In four it was sudden, the process being completed in one night in the case of one patient, and in a week or less for the other three. A gradual onset was noted in 14 patients, the process extending over from three months to fifteen years. The accuracy of the patient's statements relating to gradual onset is, however, open to question, because when they present themselves for treatment the date of onset is always remote. One patient, for instance, who was 42 years old when first seen, stated that he noted a beginning impairment of hearing at the age of 27, which had gradually progressed during the ensuing 15 years, until, at the time of the examination, he was found to be totally deaf in the left ear, with absence of bone conduction and diminished air conduction on the right. Owing to the difficulty of obtaining communications from without, these patients, when they have become completely deaf, have little if any supporting data for memorizing events, and the latter day statements of relatives or friends cannot for obvious reasons be depended upon.

Tinnitus was present in five of the eleven patients in whom the presence or absence of this symptom was noted, and is apparently more often associated with a rapid onset. It may disappear spontaneously, but there is no rule as to its duration. In one case it disappeared under anti-syphilitic treatment, but recurred after a lapse of treatment. Vertigo was encountered only four times among ten patients, but in only one was it sufficiently severe to disturb equilibration. Vomiting had occurred in only two patients and was a prominent symptom in only one of these.

In the physical examinations, signs of congenital syphilis other than the ear disturbance were noted in 91 per cent of the patients, with the Wassermann reaction alone positive in the remaining 9 per cent. Interstitial keratitis was present in 16 patients and was the most frequent stigma noted. In all but three of these patients the keratitis antedated the onset of ear symptoms by from one to twenty years, the average being from three to six years. A precedent interstitial keratitis is mentioned by practically all writers as a most striking feature of the anamnesis. This is not to be wondered at when one considers the extremely high incidence of this manifestation in congenital syphilis. Although deaf mutes are not considered here, it was of interest to note that in six patients of this series there was disturbance of speech. These were all patients whose hearing defect had been present from 15 to 20 years, though only two were completely deaf. It was noticed that their enunciation was poor, with a tendency to run words together. With one such patient it was necessary to have a relative familiar with the patient's speech defect to act as interpreter. There were five instances of Hutchinson's triad. Faulty dentition, including five additional patients with Hutchinson's teeth, saddle nose, perforation of the hard and soft palates, destruction of the uvula, and rhagades were noted with about the same frequency as for these lesions in congenital syphilis.

Involvement of cranial nerves in addition to the eighth was noted in only one patient, who had a slight ptosis of the left upper eyelid. The contention of some authors, notably the younger Fournier,[7] that cranial nerves are often involved in these patients "en bouquet" with the eighth was not confirmed. In not a single patient in our series was there any indication of an associated basilar meningitis, and of 12 patients whose spinal fluids were studied a complete absence of abnormalities was noted in eleven. The remaining fluid contained minor abnormalities which in themselves were not conclusive. In fact, careful laboratory studies of the spinal fluid and neurologic examination failed to justify the diagnosis of neurosyphilis (aside from the labyrinthine lesion) in any instance.

Otologic examinations were made of twelve patients, the results of which may be briefly summarized. In all a hearing defect in both ears was found to be present. There was complete bilateral deafness in seven. In the patients with incomplete involvement, the deafness varied from complete loss in one ear with partial loss in the other to unequal partial loss in both ears. In one patient with unmistakable inner ear involvement of both ears and complete unilateral deafness, there were associated extensive tertiary disease of the soft palate and a purulent inflammation of the eustachian tubes. These associated conditions healed under anti-syphilitic therapy without any improvement of the inner ear condition becoming apparent. Bone conduction was always found to be diminished, and in all but two patients air conduction was also decreased. The vestibular apparatus was damaged in every case, and in four instances there was complete absence of response to tests.

Illustrating the anamnesis, symptomatology and physical signs of late congenital syphilitic neuro-deafness, the following cases are typical:

Case I.—P. 148, December 15, 1921. Congenital syphilis; suppurative cervical adenitis; interstitial keratitis; destruction of nasal septum; perforation of the hard palate; bilateral deafness with tinnitus; blood Wassermann positive; spinal fluid negative; no improvement on treatment.

A colored female, aged 26 years, complaining of difficulty in hearing, gave a history containing the following positive and important negative points. One brother had congenital syphilis. The patient denied primary and secondary syphilis. At the age of nine years she had suppuration of the cervical glands and bilateral inflammation of the eyes with almost complete temporary blindness. Seven years later there was a purulent discharge from the nostrils which continued for two or three years. At the age of 19 years there was an incomplete loss of hearing of short duration with complete spontaneous recovery. The present illness began three weeks before admission with rapidly progressing loss of hearing, which had by this time become marked in one ear and almost complete in the other. There had been tinnitus since the onset. Blood Wassermann was positive and the spinal fluid negative.

On physical examination there were marked bilateral corneal opacities; complete destruction

of the nasal septum and a small perforation of the hard palate. The upper central incisors were widely spaced, but not notched. Right ear: only very loud shouts could be heard; all tuning forks were inaudible by air conduction except C2048; bone conduction was markedly shortened. Left ear: conversational tones could not be heard; all tuning forks were audible by air conduction except C128; bone conduction was shortened. Weber's test was referred to the left. There was no response to vestibular stimulation.

After ten weekly injections of arsphenamin, there was improvement in the patient's general condition, but no improvement in hearing.

Case II.—P. 146. November 8, 1921. Congenital syphilis; osteomyelitis of the ankle bones; saddle nose; ulceration of velum and uvula; destruction of supraorbital ridge; Hutchinson teeth; bilateral complete deafness; blood Wassermann and spinal fluid studies negative; no improvement on treatment.

A white man aged 21 years was admitted with the complaint of poor hearing. No history of syphilis in the family could be elicited, and primary and secondary syphilis were denied. At the age of five years he had a swelling of one ankle, which was diagnosed and operated upon as tuberculous osteomyelitis. A year later he developed a bloody purulent discharge from the nose and a destructive process of the right orbital ridge. Temporary blindness due to interstitial keratitis ensued at the same time. At the age of fourteen he became conscious of a hearing defect which gradually became more marked during the next seven years, until two weeks before admission it suddenly became much worse and was accompanied by tinnitus.

The positive points in the examination were complete destruction of the right supraorbital ridge with a deeply depressed scar; saddle nose; numerous bilateral corneal opacities; marked destruction of the velum and uvula; notched upper central incisor teeth; blood Wassermann and spinal fluid studies both completely negative; complete bilateral deafness; all tuning forks inaudible by air and bone conduction; no response to vestibular tests. There was no improvement following anti-syphilitic treatment.

Very little appears in the literature concerning the pathology of this interesting condition and the reports are for the most part conflicting. Some investigators have thought that the condition originates in subacute or chronic meningitis of the base. Autopsy findings are advanced to support this view.[8] The patients who came to autopsy, however, appear to represent still-births and congenitally syphilitic infants who died early; whereas, the patients who manifest eighth nerve involvement during adolescence can be sharply differentiated from such material. It would appear, therefore, that the same set of conditions cannot be said to be in operation pathologically in the two types, and this opinion is substantiated by our failure to demonstrate other clinical or laboratory evidence of neurosyphilis. Gruenberg[9] reports the finding of treponemes in the facial and auditory nerves of a seven months' fetus. Fournier[7] and others have found hemorrhage at the level of the termination of the acoustic nerve. Practically all observers have found an increase of connective tissue along the course of the smaller blood vessels of the labyrinth and periostitis of the bony labyrinth and of the bony canal through which the nerve passes.[10] Several observers have reported the absence of perilymph in the vestibule.[4] [11]

After the process is once established, treatment is of little avail and the prognosis is bad. If the patients are seen early before there is marked impairment of nervous function, further loss of function may be prevented. These patients, however, furnish a powerful argument in favor of the early, vigorous and sustained treatment of all congenitally syphilitic children, particularly those that survive the first year of life. The high incidence of interstitial keratitis in this group and the fact that it so frequently precedes the eighth nerve disease offers a chance for the early selection of a majority of these patients before the auditory apparatus is dangerously involved. Extensive late lesions elsewhere in the body, particularly of the bones of the head and of the bones and soft parts composing the upper respiratory tract, serve to mark the patients most likely to develop lesions of the auditory apparatus. But, after all, neglect of early treatment is the responsible factor in all cases, and it is in correction of this omission that the remedy is to be found.

SUMMARY

Twenty-two cases of deafness due to late congenital syphilis are reported. The incidence of this form of deafness is approximately 10 per cent. Males are more susceptible, particularly negro males. The age of onset approximates that of puberty. The onset may be sudden or gradual and is usually accompanied by tinnitus and vertigo. The symptom complex is

characteristic. Active manifestations of congenital syphilis other than aural lesions co-exist with or antedate the malady and are often of unusual severity. Of these interstitial keratitis is the most common. The blood Wassermann test is positive in over 90 per cent of the patients, and spinal fluid studies were invariably negative for abnormalities due to cerebrospinal syphilis. Cranial nerves other than the branches of the eighth are rarely involved. The prognosis is not good, and the results of treatment are poor. Adequate treatment of all patients with early congenital syphilis is advocated as a prophylaxis for late aural involvement.

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DISCUSSION

Dr. Lloyd Thompson, Hot Springs, Ark.—The most striking feature of this paper is the fact that so little evidence of any involvement of the nervous system was found. I certainly had been of the opinion that in these late congenital syphilitics we would find a large percentage with some evidence of neurosyphilis. This paper serves to emphasize the importance of thinking of syphilis in all obscure cases. Cases of oncoming deafness, beginning at about the age of puberty, should be investigated most thoroughly for any evidences of syphilis. This should include investigation into the parents, the brothers and sisters of the individual, and also a thorough investigation of the individual himself, both clinically and from a laboratory standpoint.

Dr. Keidel (closing).—The patients on whom this report is based are almost invariably about the age of twelve years. In the clinic from which they were collected we do not see early cases of congenital syphilis. There is no doubt that in the early cases of congenital syphilis involvement of the central nervous system is more prevalent than this number of ear cases would indicate, and that there is a higher incidence of involvement of the eighth nerve amongst the children up to the age of one year. They, however, die in a very high percentage of cases and are not studied.

VACCINES IN THE TREATMENT OF THE SECONDARY INFECTION IN PULMONARY TUBERCULOSIS*

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Nothing dismayed by past disappointments, many enthusiastic workers still hopefully await the day of the arrival of the specific which will prove curative of pulmonary tuberculosis. Despite some leads and a few hopeful lights that day is still far from us. But if our search has thus far proven fruitless, we have still discovered not a few remedial agents to assist in the conquest of the disease, or at least to ameliorate certain distressing symptoms at times, and thus aid in the general result obtained. Of aid in certain carefully selected and more carefully treated cases is artificial pneumothorax. Another and more occasionally helpful is the so-called autogenous vaccine.

Several years ago we held high hopes of success from the use of vaccines in tuberculosis and then with almost as sudden and characteristic a disappointment, we gave up their use, again demonstrating our well known professional proclivity to swing from one extreme of the arc of enthusiastic approbation of a new therapy to the opposite one of disappointed neglect of it.

This discussion today presents nothing new save an effort to review the situation in the light of the literature available to me with the hope of eliciting discussion of the merits, demerits, and position of a method of therapy which on exceptional occasions gives brilliantly successful results, but usually is disappointing.

The recent wide interest in the biologic sciences has naturally been reflected in

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tuberculosis therapy. Though the role of the mixed or secondary infection in tuberculosis is still moot to the point that no one yet has defined with precision its full extent, danger, and damage, all workers are more or less of the opinion that such an infection has an importance, greater or less. One point of agreement is that with the progress of the disease this infection is always present in apparently increasing effect. In stating this I am aware that practically all the symptoms and pathological changes commonly associated with secondary infections may occur as a result of tuberculous infection alone. With the progress of the disease, as has been shown by Pettit[1] and by Brown[2] and his co-workers, there is also an increasing incidence of secondary infection of the blood stream. And yet, so far no one has been able definitely to evaluate the part this secondary infection in lung and blood plays in symptomatology and pathology. One of the chief difficulties is that the bacterial flora of the sputum are changing from day to day and cultures of sputum from the same patient on successive days rarely give identical percentages of the various secondary organisms. Further, the cultivation of various strains of bacteria in the sputum is far from proof of the causal relationship of these bacteria to certain symptoms exhibited in the course of pulmonary tuberculosis, nor is their presence in the sputum an index of the severity of the infection.

Paterson[3] is inclined to attribute slight, if any, influence to the secondary infection in the progress of tuberculosis and expects very little help from the use of autogenous vaccines, which when they do help may do so from the non-specific protein reaction. Their special indication, according to this author, is a very profuse expectoration.

Pottenger[4] states that while mixed infection probably occurs at times, that it occurs as frequently as has been generally believed, is open to question. While he was formerly a staunch believer in mixed infection being an important process in all cases of advanced tuberculosis, he is gradually becoming more of the opinion that associated bacteria are comparatively an unimportant part of the pathology of tuberculosis.

Fishberg[5] is inclined to the belief that while mixed infections are very frequent in tuberculosis, the contaminating microorganisms are not responsible for most of the symptoms of the disease. He states:

"A phthisical patient may be infected with pneumococci, which produce pneumonia; influenza bacilli, producing grippe, etc. But this can no more be considered mixed infection than the association of phthisis with diphtheria, gonorrhea, etc.

"The streptococci, staphylococci, pneumococci, etc., which are often found in tuberculous cavities may, and often do, influence the symptomatology, course, and termination of the disease, but in incipient cases the microorganism which is responsible for the disease is only the tubercle bacillus."

Corper and Enright[6] concluded after the study of direct cultures, inoculation experiments and the saliva of normal individuals that the organisms in the sputum in pulmonary tuberculosis ordinarily play an insignificant part in the disease.

Norris and Landis[7] say:

"It is the belief at present that the formation of a cavity is due in large part to the presence of secondary infections with the various pus-producing organisms. These organisms produce a liquefying necrosis of the caseous areas and thus hasten their breakdown."

Hayes,[8] after a study of cultures from the lungs of patients coming to autopsy at Oteen, found the streptococcus hemolyticus and other organisms frequently in caseous areas as well as in cavities in the lungs. He thinks that these are probably factors in cavity formations which were very frequent in these autopsies because the hemolytic streptococcus was found in the caseation which precedes cavitation.

Brown and his co-workers,[9] after a study of secondary infection in tuberculosis made eight or ten years ago, conclude:

"The most frequent occurrence of positive blood cultures in febrile and ulcerative cases is due, we believe, more to the fact that such cases have more extensive and possibly fresher ulcerative pulmonary conditions. We have been unable to connect causally the positive blood findings with the fever.

"In conclusion, while we believe we can prove the occurrence of secondary invasions by various organisms, we have as yet been unable to convince ourselves that such secondary infections play constantly an important part in pulmonary tuberculosis."

Is the mixed infection in tuberculosis a true symbiosis of the other microorganisms with the tubercle bacillus wherever this bacillus may be present? Accepting the definition of symbiosis as a close association of different organisms essential for the producing of certain pathology or clinical symptoms, I hardly feel that it is a true symbiosis, as not one of these various secondary invaders is essential for the production of tuberculosis. They may fraternize with the tubercle bacillus or simply co-exist with it. Some may repress, others stimulate the growth of the tubercle bacillus, while it is quite possible they have no effect upon it. Certain symptoms such as high fever, rapid loss of weight and strength and harassing cough, may well be due to the mixed infection.

So with a full appreciation of the uncertainty attendant upon the use of the so-called autogenous vaccine (which for the sake of accuracy it might be mentioned is a misnomer and the better term might be bacterial antigen), one may well ask if there is justifiable ground for the use of these in tuberculosis therapy and if so under what conditions and restrictions. For this uncertainty extends as I have said all the way from a lack of definite knowledge of the role of the secondary infection in pathology and symptomatology to the proper making of a vaccine containing organisms in proper proportions to effect immune response and hence benefit the patient and be of no danger to him. Should there be definite information available as to what portion of the pathology and symtomatology in tuberculosis can be with certainty attributed to secondary organisms, the propriety of the general use of autogenous vaccines would be admitted, subject to the biological principles involved.

Again the recent development of non-specific protein therapy at once raises the issue, what part of the success of vaccine therapy is due to the non-specific protein reaction? Wright[10] has formerly been perhaps the most ardent exponent of the theory of specificity in vaccine therapy, but in the light of his recent work he states in his last paper on the subject available to me:

"We are, however, here considering primarily the question of principle; and in connection with this what is of fundamental importance is: that we should discard the confident dogmatic belief that immunization must be strictly specific. We should instead proceed upon the principle that the best vaccine to employ will always be the vaccine which gives on trial the best immunizing response against the microbes we propose to combat.

"I would point out that this would almost certainly not involve any revolutionary change in the accepted practice in either serum therapy or in prophylactic or ordinary therapeutic inoculation. But it would mean taking into account in cases which proved intractable to treatment with the homologous vaccine the possibility of seeking for collateral immunization by inoculating a microbe, or mixture of microbes other than that with which the patient is infected. The trial of this procedure might perhaps recommend itself where from the outset there is very little immunizing response to the homologous vaccine, and also where, as in long-standing cases of tubercle or streptococcus infection, the power of direct immunizing response to the corresponding vaccine is becoming exhausted."

The more common secondary invaders of the lungs in tuberculosis as shown by cultures from sputum are the streptococcus, streptococcus viridans, streptococcus hemolyticus, streptococcus non-hemolyticus, staphylococcus, strepto-pneumococcus, micrococcus catarrhalis, influenza bacillus, diphtheria bacillus, colon bacillus, and possibly other cold-producing organisms not readily recognized. It should not be forgotten that nearly all of these micro-organisms have been found in the mouths of people apparently in good health. Some careful observers have maintained that by methods of thorough washing of the sputum cultural results will be considerably diminished and the number of organisms grown which can with assurance be stated to come from a pulmonary or bronchial habitat reduced almost to the vanishing point.

As Weaver[11] has well pointed out, streptococcus vaccines should always be autogenous, inasmuch as the various strains of streptococci differ among themselves in essential immunological peculiarities. A polyvalent streptococcic vaccine active against all types of streptococci would of necessity have to contain so many strains as to make it practically

valueless, because this multiplication of strains would necessarily so reduce the content of the essential one as to render it therapeutically inert.

In my experience, vaccines from one of the streptococcic strains have given the most satisfactory results. Possibly this was due to the specific immune response, and possibly to the benefit of the leucocytosis frequently associated with this type of infection. According to Petersen, the streptococcic vaccine does not seem to be a good agent for non-specific stimulation, while for this purpose the staphylococcus vaccine is more useful. Is the benefit, then, of the combined streptococcic and staphylococcic vaccine the result of streptococcic specific and staphylococcic non-specific reaction?

So far as I have been able to learn, there have been published no comprehensive blood counts in connection with autogenous vaccine therapy in tuberculosis. In view of the quite frequent leucocytosis which may reach a considerable height found in those cases in which the streptococcus is a common secondary invader, it would seem worth while to direct thought to the possible implications here presented. Results in such cases carefully treated are usually more gratifying than in cases without a leucocytosis. May not the white cell count prove of value in determining the use of an autogenous vaccine and also possibly be a guide in dosage?

Minnig[12] reports benefit from autogenous vaccines as follows:

	Imp.	Stationary or Worse
Pneumo-streptococcus	3	4
Pneumococcus	3	5
Streptococcus	11	11
Streptococcus viridans	2	1
Streptococcus hemolyticus	15	7

The author further noted improvement according to stage of disease as follows: 8 out of 9 cases, first stage, benefited; 10 out of 12, second stage; and 15 out of 42, third stage.

Pettit[13] reports on 280 cases in which he used autogenous vaccine with the idea of preventing hemorrhage and had such encouraging results that he believes he is justified in using them "in a large number of cases as a protective measure" against hemorrhage. What other benefit accrued to the patient save an apparent lessening in the chances of hemorrhage he does not state.

Bonney[14] is quite properly conservative in his estimate of the value of autogenous vaccines, and while admitting that he has had some encouraging results from their use fails to state in what type of mixed infection he had the greatest success. He feels that certain febrile cases failing of response to the usual conservative measures of bed rest, etc., offer perhaps the best field for their use.

Since the sputum of the tuberculous patient contains several strains of bacteria, autogenous vaccines must necessarily be subject to the hazard of improper percentages of the contained organisms, thus making dosage and interpretation of results quite difficult. And further, as Bonney[15] says:

> "It is entirely possible that owing to modifying influences pertaining to the dose and to important changes in the invaders incident to environment and adaptation, certain constituents of the vaccine may later become not only useless but actually harmful by prolonging the negative phase and lessening individual resistance."

Unfortunately the difficulties here cannot be overcome by the opsonic index or the complement fixation test with any degree of uniformity for the existence of an intercurrent complication might easily vitiate it. It may be impossible to conclude that a positive test from one organism gives definite information that this is the offending agent in the infection. Is it not quite possible, as has been suggested by Babcock in a discussion of asthma, that one of the potent causes of the failure of the autogenous vaccines in tuberculosis is the fact that the autogenous vaccine as ordinarily used is invariably made from aerobic growths while it is quite possible anaerobes may be the offending organisms?

The group which in my experience is most apt to receive benefit from them is the moderately or far advanced case with considerable moisture and profuse expectoration, usually bilateral, with or without some fever, that fails to respond to the routine measures of therapy and management, and in whom it is difficult to restore lost weight. The case in which persistent fever of not very great extent cannot be

overcome by the usual methods may also present a hopeful field, though here possible foci of infection must be rigorously rooted out beforehand.

This, then, does not leave a very large field for the use of the bacterial vaccine in tuberculosis therapy. I think it well in this era of more or less enthusiastic vaccine administration to warn against the indiscriminate use of vaccines in tuberculosis, although the warning may well be in the nature of supererogation to this body. The case in which it is to be administered must be chosen with great care after thorough study, and only after the usual conservative measures of treatment have failed. "The cure" does not exist in a vaccine. Again, in evaluating the effect of the vaccine it is well to remember constantly that the psychic boost of specific therapy may well play a part in the patient's improvement, as may also a more meticulous cooperation on the part of the patient who perhaps through discouragement has become more or less lax in his observance of the proper rules of treatment. And again, in our present state of knowledge, we have no guarantee of the permanency of improvement under the use of one vaccine whose benefit may be quite temporary and then vanish, while its successor may or may not be successful.

I have purposely omitted any discussion of the so-called stock vaccine. I can think of no good reason for its administration save the necessity for work under conditions in which the making of autogenous vaccines is an impossibility and the only available vaccine is the stock, and unless one indulges in the hope that the non-specific protein reaction is the essential factor of benefit in vaccine therapy. This may be the case when not too violent a focal reaction has been excited. Present-day conceptions make it fairly safe to assume that a non-specific injection usually within twenty-four hours will frequently light up with a focal reaction any circumscribed inflammatory process irrespective of its bacterial etiology or its location. Wolff Eisner[16] has recently pointed out that of these various processes, tuberculous lesions are perhaps more sensitive because of a more profound sensitization of the tissue cells of the host against protein in general. This immediately brings to thought, then, the dangers of a method of therapy which, while applicable with benefit to the stimulation of a chronic inflammatory focus, in the case of the tubercle offers a hazard of disorganization of the connective tissue capsule sufficiently to cause extension of the process and irreparable injury. Whatever the theoretical probabilities, focal activation in tuberculosis, whether therapeutically induced or not, is hazardous.

In just what percentage of cases to use the autogenous vaccine, I am not prepared to say. Those of us whose fortune it is to have patients out of the more congested city districts are very commonly impressed with the remarkable and rather general disappearance of secondary organisms from the sputum. And when used, my own results have been of only sufficient encouragement to cause me to persist in their use with considerable conservatism and modified hopefulness of their efficacy. During recent months I have used the method in only 17 cases with beneficial results in two cases and temporary benefit in one other. Vaccines made from the streptococcus group combined with the staphylococcus seemed more beneficial.

If, then, these vaccines are of benefit in tuberculosis, how do they help? I suspect no one today is rash enough to discredit the fact that antibody immunity is a vital factor in protection against infectious diseases and in overcoming actual bacterial infection. Specific immune response, then, presupposes specific infection. The therapeutic effect, however, of the non-specific reaction would seem to be largely independent of the specific antigen-antibody balance whether we accept Weichardt's "omnicellular plasma activation" as the true explanation or Starkenstein, Wright's or Petersen's[17] theories. The benefit, then, may well be a combination of both specific and non-specific reactions.

At times serious damage has resulted to the patient from the use of autogenous vaccines, and yet when properly administered there is no great danger from them.

Minnig[18] emphasizes the necessity for small dosage at the beginning of the treatment and begins with as low as five or ten millions. I have never found it necessary to start with less than fifty millions, although I concur in his warning to increase the dosage slowly. Too early repetition may catch the patient still in the negative phase with the very probable danger of a reaction as manifested by a chill or chilliness, considerable rise in temperature, malaise, discomfort or oppression in the chest, sweating, prostration, etc. This is best combated by a large dose of atropin immediately. A failure of satisfactory response to the vaccine as manifested by symptomatic improvement after a sufficient length of administration should cause its discontinuance, as should the aggravation of existing symptoms provided these are not caused by injudicious or enthusiastic dosage or too early repetitions, matters adjusted by the application of the proper rules of dosage. The interval between doses should never be less than three whole days, rarely longer than seven, with five as the safest medium. A complicating acute infection should necessarily be a contraindication to the use of an autogenous vaccine. I have had no experience with this method in stage one cases, and think that as routine in these it is strongly to be condemned, although exceptions may be made occasionally.

Before closing I wish emphatically again to state my position that autogenous vaccines should never be used in pulmonary tuberculosis as a routine measure. They are of very limited value and should be administered only to selected cases free of demonstrable foci of infection which have been sufficiently studied to warrant the attempt at specific therapy and in whom the usual routine conservative measures have failed. They should never be used to the exclusion of these measures, and if reliance is put upon them with disregard of more essential matters a great deal of damage will result. The dose should be carefully calculated and an attempt at a general reaction of serious nature should not be made. Persistence in their use after a fair and honest trial in the individual case without improvement on the patient's part should be sufficient ground for discontinuance.

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DISCUSSION

Dr. Louis Hamman, Baltimore, Md.—Such experience as I have had with the use of vaccines in pulmonary infections inclines me to view this method of treatment with utter distrust. I have treated only a few instances of pulmonary tuberculosis with vaccines. My experience has been almost entirely with other types of pulmonary infection, chiefly the type commonly spoken of as chronic non-tuberculous pulmonary infection. In the cases that have been under my observation I have seen no benefit from vaccines. It is therefore a pleasure for me to have listened to the fair and very conservative presentation that Dr. Cocke has given. I should like to over-emphasize the conservatism.

There is a tendency in some quarters to lay entirely too much emphasis upon secondary infection in tuberculosis, and to try to persuade one that the cardinal symptoms of phthisis are due to the secondary infection and not the tuberculosis. This view is unwarranted. You may be assured that the tubercle bacillus and its effects are the essential factor and the secondary invaders relatively unimportant.

Dr. Cocke has pointed out the possible effects of vaccines as specific antigens and as foreign protein. If the effect is a reaction to foreign protein, then it matters little what organism is employed. If, on the other hand, a specific influ-

ence is desired, then there is great practical difficulty in obtaining a proper vaccine. Sputum cultures are sometimes misleading in so far as they do not always reproduce the pulmonary flora. I have seen a sputum culture of almost pure influenza bacillus when lung puncture gave a pure culture of pneumococcus. If a number of organisms are found in sputum culture it is impossible to prepare an altogether satisfactory vaccine. The unreliability of sputum cultures is further illustrated by the frequent changes in flora. I have seen from one patient a predominating pneumococcus sputum culture change after a week to a predominating influenza bacillus culture without any apparent change in the patient's condition and certainly without any important change in the underlying pulmonary disease.

I cannot refrain in conclusion from saying a word about the difficulty of appraising the value of any treatment in pulmonary tuberculosis. The natural course of the disease untreated is so varied and uncertain that it is extremely difficult to gauge the effects of treatment. That some patients improve and others grow worse is the common mark of all treatments. You know how frequently premature enthusiasm has already led the profession to disillusionment. There is no objection to trying different treatments in tuberculosis unless they serve, as is often the case, as an excuse to neglect those simple well-established principles that are the backbone of successful tuberculosis therapy. Dr. Cocke has found sufficient promise in the vaccine treatment of the secondary infection in pulmonary tuberculosis to feel encouraged to continue his studies.

Dr. L. J. Moorman, Oklahoma City, Okla.—I hoped Dr. Cocke might bring out some new points with reference to the diagnosis of the presence of mixed infection. There may be a question in the minds of many physicians as to what role the secondary micro-organisms play in the course of pulmonary tuberculosis. Is there any way to determine when mixed infection is present and when it is not present? Pathological studies have revealed cases of pulmonary tuberculosis with cavities, and yet no evidence of mixed infection. Clinical experience would indicate that it is most difficult to determine the presence or absence of mixed infection. May I cite two examples?

A young female with advanced tuberculosis had all symptoms of extreme toxemia, which Dr. Cocke gave as an indication for the use of vaccines. While the question of inducing artificial pneumothorax was being considered in this case, there was a spontaneous pneumothorax and the patient experienced all the symptoms of extreme shock, such as high fever, rapid pulse, pain, difficult breathing, and so on, with development of fluid in the pleural sac which was nonbacterial, and pneumothorax was instituted a few weeks later, and some of the fluid withdrawn. This patient is apparently making splendid progress toward recovery.

About the same time I had another patient with identical symptoms, with practically the same degree of pathology in the chest so far as could be determined, who had spontaneous pneumothorax in the course of an artificial pneumothorax, with purulent infection, and death. Are we justified in assuming that in the first case there was no mixed infection, and in the second case there was mixed infection? These questions are difficult to answer.

For several years I have had a differential white blood count on all my cases. Invariably in the closed tuberculosis case we get a normal leucocyte count with a lymphocytosis. As soon as tubercle bacilli appear in the sputum we get a moderate leucocytosis with a normal differential count. May this be accepted as evidence of mixed infection? We also have about the same blood picture in non-tuberculous pulmonary infections, including the bronchiectatic cases, which might be taken as further evidence that this finding tends to indicate a mixed infection. Our great difficulty lies in the fact that we have no definite way or ways of determining when mixed infection begins and when it terminates.

I thank Dr. Cocke for presenting to us such a conservative paper on the use of vaccines in connection with pulmonary tuberculosis, because people all over the country are running wild on the subject of vaccines.

Dr. R. E. Flack, Asheville, N. C.—We are aware that there is a toxemia which may develop in the course of tuberculosis. Patients developing it may be put to bed and carefully watched and treated, but the fever persists. In some of these patients it is found that an associated infection stands in relationship to the fever, as the fever often subsides or is materially reduced after the administration of a suitable vaccine. It is our experience that the pneumococcus organism is found more often as a secondary invader.

There is no doubt that the field of vaccine therapy is limited, and the cases that yield to vaccines, if not followed carefully after a few weeks' time will have relapses. We have followed these cases in our laboratory and have checked them up with complement fixation. The blood serum of all patients treated with pneumococcus vaccine gave very strong complement fixation. Taking complement fixation as an index of immunity, one must conclude that the immunity acquired by the administration of pneumococcus vaccine is short-lived, as in three weeks after treatment the blood serum is only slightly positive. To maintain a maximal degree of immunity, it is advisable to continue the vaccine every week to prevent a recurrence of the mixed infection.

In some cases we lose the effect of vaccine therapy for the reason that the vaccine is discontinued too early, especially in cavity cases. If you once get rid of a mixed infection, within six weeks, during the season of the year when catarrhal inflammations are most prevalent, it may recur. For this reason, as stated above, it is well to continue the administration of a suitable vaccine.

Dr. Virgil E. Simpson, Louisville, Ky.—A clear conception of the difference between an infection which is limited and producing few clinical phenomena, and one which is producing marked symptoms in the way of febrile change, would lead to a logical conclusion as to whether or not vaccines are of a great deal of help in any condition, whether it be so-called mixed infection of the pulmonary structures conjointly with tuberculous involvement or not.

I have long since come to the conclusion that in purely localized infections, where the body at large is not being called upon to manufacture antibodies to any great extent, if at all, vaccines are helpful. These are essentially chronic and localized conditions. In a generalized infection, a bacteriemia, characterized by temperature processes, by rapid loss of strength and weight, and other evidences of a febrile process, vaccines are in the main useless. It is an entirely different proposition in administering to these cases vaccines and sera. In one case there has been a demand made on the vital powers of the individual to manufacture immune bodies; he is already the subject of bacterial attack and is failing to revive under the assault. In the other case you introduce with the serum ready-made antibodies which either are inimical to the growth of the offending germ or aid in the neutralization or destruction of the toxins; the patient is but a passive subject benefiting from the product of vital reactive processes of the animal from which the serum is obtained. Vaccines are for chronic, localized infections and prophylaxis; sera for acute, systemic infections and prophylaxis of a short-lived nature. This statement may well be considered axiomatic in specific therapy.

It would seem unnecessary to emphasize the statement that stock vaccines are not scientifically used unless identification of the causative organisms is established. Even then their values must be less than that of autogenous vaccines since strains of bacteria vary.

Stock vaccines in mixed pulmonary infections are of doubtful value and autogenous ones seldom produce good results.

Dr. J. T. Wolfe, Washington, D. C.—For the past seven years I have been interested in vaccine therapy. In the beginning of my work along this line I discarded entirely the theory of immunity in a patient by what would be a specific vaccine.

In examining the sputum of a tuberculous case I was struck with the vast number of pus cells. To my mind they represented dead soldiers. It occurred to me if we could call out more soldiers that these soldiers, white cells, leucocytes, polymorphonuclears particularly, would attack anything in sight, any invading organism of whatever nature. Working on that hypothesis, I found that the diplococcus pneumoniae gave a higher leucocyte count in an infection. For quite a time I used a combination of the streptococcus and diplococcus pneumoniae vaccine, and then later I added to it the Fraenkel bacillus and staphylococcus. I have treated 600 cases of chronic bronchiectatics, acute bronchiectatics, and tuberculous cases. I have had some amazingly gratifying results in tuberculosis. Some in children, running a temperature with definite lesion of the lung, have cleared up absolutely and have remained so for years. These children are now attending school, have no fever, and are apparently well.

I remember the case of a woman, 71 years of age, who ran an evening temperature of 104°. I put her on vaccine therapy before I put her into an institution. When she arrived there her leucocyte count was 19,000. In a few weeks her temperature was normal and she returned to her home in Virginia, where she resumed her household duties. Her cough had stopped. Under the microscope tubercle bacilli had disappeared. All mixed infection and pus cells disappeared from the sputum.

I remember another case of a man whose sputum was laden with tubercle bacilli. Gradually the tubercle bacilli and streptococci disappeared from his sputum.

This work has been based entirely on the theory of building up and following up the white cells, and not that of injecting more of the same type of toxin into the body with which the patient was already overburdened.

Dr. R. McBrayer, Sanatorium, N. C.—We are doing tuberculosis work among a class of people who cannot afford good doctors, and who therefore come to our state sanatorium. We see surprisingly frequently patients who give a history that they have been slowly going down hill until they dropped in to see Dr. So and So, who said: "You must take a vaccine for that." The patient says, for example, that she took a vaccine at 11 o'clock and at 4 o'clock in the afternoon her temperature was 104°. Dr. Cocke's conservatism is certainly very timely. You must remember that you have tuberculosis to deal with. It is not a secondary infection that is making the patient primarily sick. It may be a contributing factor or it may not, but you must not do anything that will aggravate the tuberculosis that is there.

I know one very eminent pathologist who says that the tubercle bacillus is not at all proteolytic. Does it produce these cavities or not? Maybe the secondary infection did. That is a problem that must still be worked out by conservative men.

There are other organisms in the sputum to contend with. Other than the pallid spirochete, they are difficult to differentiate from each other. They are to be looked after as we go along. Sometimes, as you all know, we see a case with very diffuse tuberculosis throughout one and a half of the lungs. This we can determine by physical examination. The history is definite.

You look at the x-ray and it aids you in making the diagnosis. The patient may be afebrile, feeling pretty good, not far from normal in weight, and not very toxic. Another patient whom you can arbitrarily classify as incipient tuberculosis so far as actual pulmonary involvement and symptoms are concerned is very sick. What is the difference?

Dr. W. R. Kirk, Hendersonville, N. C.—In speaking of the dangers of the administration of vaccines, we should take into consideration the possibility of the sensitization of these patients, especially when we do not know with just what organism we are dealing. That is one of the dangers. I have had the experience of producing asthmatic symptoms in some patients after the indiscriminate administration of stock vaccines, and now never give them when an autogenous vaccine is available.

Dr. Cocke (closing).—I knew Dr. Hamman's position when I asked him to discuss my paper. I want some definite, absolute stand taken on this for two reasons: one of which is the fact that the biological houses are scattering widespread all over the country literature regarding vaccines, and detail men are going around with these vaccines, carrying them in their grips for general distribution, and if anybody has a cough or sneeze or any expectoration they think these people have to have vaccines.

Patients come to us by the dozen who want a "serum," and it is on account of the indiscriminate use of vaccines by certain physicians in pulmonary tuberculosis work that this paper was prepared and presented. I tried to emphasize by the very few cases in which I have used vaccines, and the very poor results obtained, that they should be used in these cases only after a complete failure of the usual conservative measures. I do not use them until I am convinced I have to do something radical. Just as a very careful study and selection of cases must be made before the introduction of artificial pneumothorax, so must one be sure in his choice of a case suitable for so-called vaccine therapy.

I cannot answer Dr. Moorman's question with regard to the leucocytes. I can give him an impression only, as I have not the figures at hand.

With regard to the advisability or not of administering typhoid vaccine as a prophylactic measure in incipient or suspected tuberculosis, my own experience is limited in that respect, as we have not much typhoid. My experience leads me to believe that if you give a typhoid vaccine so as not to cause a focal reactivation, there is practically no danger.

While the question of protein therapy in tuberculosis is a very interesting one, it should still be guarded by every possible care, since the dangers of focal activation are so great in this method of treatment. Therefore, I condemn the routine use of vaccines in tuberculosis.

A PHYSIOLOGIC AND PHILOSOPHIC STUDY OF THE RELATION OF SLEEP TO BODILY NUTRITION*

By George M. Niles, M.D.,
Atlanta, Ga.

"Let me have men about me that are fat,
Sleek-headed men, and such as sleep o'nights."
—Shakespeare's "Julius Cæsar."

That the devout Psalmist sang "He giveth His beloved sleep;" that old Homer exclaimed "Sleep is the gift of God;" that the poet Young wrote of it in his "Night Thoughts" as "Tired Nature's sweet restorer," and also

"Man's rich restorative, his balmy bath,
That supplies, lubricates and keeps in play
The various movements of this nice machine,"

that Depew calls it "The solvent of longevity, health and work;" while the late Henry Clews, the financier, said, "Sleep means everything to a man—good health, good looks, will power, and self-confidence;" that wise men from Socrates to Russell Sage have advocated one-third of the twenty-four hours in bed—all these expressions show a deep appreciation of this restful attribute among all ages and conditions of human thought.

Sleep, as a "balm to hurt minds," has been thoroughly threshed out by the neurologists, and, as a desideratum in all acute and continued diseases, it will be found mentioned on nearly every page of the various works devoted to therapeutics.

As to the actual influence of sleep on digestion and nutrition, however, there is some conflict of opinion, and in this article the writer will endeavor briefly to cover the subject in a manner helpful to those interested in practical dietetics.

It is a well known physiologic fact that the elimination of carbon dioxid and absorption of oxygen are diminished during sleep, mainly because the muscles are less active.

Tigerstedt places the comparison of metabolism between the sleeping and waking state as 100 to 145, but claims it to

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be dependent upon cessation of voluntary movements;

"for it may reach as low a level in the waking condition, if the muscles be completely relaxed and every voluntary motion suppressed."

While other secretions are diminished during sleep, this does not apply to those of the digestive apparatus.

"It is sometimes stated that the digestive secretions are diminished during sleep, but the statement does not rest upon satisfactory observations, and may be doubted" (Howell).

"Sleep does not exercise the least influence on the secretory work of the gastric glands" (Winfield Hall).

Also the writer has many times listened over the intestines of sleeping individuals and noted peristaltic activity continuing with unabated regularity.

No one would deny that a baby thrives best, and puts on weight most rapidly, when he can sleep soundly after each full meal "from the maternal fount." It is a frequent custom among those who perform arduous physical labor to take a sound nap during the noon hour immediately after eating; and some of the finest specimens of muscular development observed by the writer have been those who retired promptly after eating a hearty supper and just as promptly went to sleep.

As to the movements of the stomach and intestines during sleep, those movements are to all intents and purposes as active as during the waking hours, less the stimulation of extraneous impressions produced by muscular exercise or play of emotions. Some physiologists claim that gastric and intestinal mechanisms are abrogated during sleep, but Dr. W. B. Cannon, in reporting some of his investigations upon animals, writes:

"It is worthy of note that nearly all the animals curled up and slept during the time between observations; nevertheless the progress of food through the intestines continued. The statement is also made that at night, even without sleep, the intestines are almost entirely at rest; that this is their normal time for repose. I have seen both large and small intestines actively at work, however, from half past 9 until half past 10 at night." These statements the writer has several times personally verified.

One qualification should in fairness be allowed, and that is the lessened influences of the reflexes during sleep, especially deep sleep. The following from Landois, while not entirely in accord with some of the conclusions just drawn, calls attention to the diminution of reflex action, affording a basis for practical deduction later on:

"During sleep there is a reduction in the activity of gastric and intestinal movements and in the secretions, which indicates a lessening in the activities of the respective nerve centers, and the diminished reflexes indicate a lessening of the activity of the spinal cord."

With the last statement the writer is in accord, but the preponderance of proof would permit us to assume that during sleep the gastric and intestinal secretions are poured out with unabated freedom, and that the mechanics of digestion progress in an orderly manner. We must not, however, lose sight of the decided psychic influence for good or ill exercised during waking hours. That pleasurable sensations may augment the flow of gastric juice, even when no food reaches the stomach; or that disgust may check its secretion has been amply proved by Pavlow and others. The fragrant cigar after a savory meal, coupled with peace of mind and pleasant society, lends a psychic aid to digestion which is entirely absent when the reflexes are dulled by sleep. Again, that fear may cause peristalsis is only too well attested by many of our war veterans, who feelingly remember their "hurry calls" on the eve of their first battle.

Another point to consider is the motor power of the stomach. The writer has found that in four out of seven tests with a barium meal, where the stomach would barely empty itself in four and a half waking hours, it was not quite empty if the subject observed had been asleep part of the time. This number is too small to be conclusive, but it is strongly suggestive of the role the waking senses may unconsciously play in assisting this viscus to perform the mechanical part of its task.

When the brain is alert, the reflexes are on guard and the voluntary muscles are at work, each department of the human economy is calling for its quota of innervation and blood. These different departments are exacting their tribute from the constructive forces and turning over to the excretory organs the products of combustion and waste. During this period

the digestive department can only draw a "working interest," not being permitted to put away any appreciable surplus until the day's activities are ended. Sleep stills the voluntary movements, decreases the carbon dioxid output, and makes the least demand on the involuntary vital mechanism. It is then that Nature, our industrious handmaiden, begins her constructive housekeeping.

"She does it in an orderly cooperative way, following a regular method of work in repairing waste, actively forming new tissue, and giving just the proper amount of care and nourishment required to all parts, both mental and physical in regular sequence."

When Shakespeare wrote of fat men who sleep o'nights he recognized a principle patent to every one; for those who sleep much, thereby allowing the plentiful recuperation of both body and nerves, are generally rotund and cheerful. Dickens' fat boy so characteristically portrayed in "Pickwick Papers" might be cited as a "near-classic" illustration that there may be as much truth in the injunction, "Sleep and grow fat" as the old saw, "Laugh and grow fat."

It must not be understood that the writer advocates heavy meals at night, or articles of food calculated to tax the propulsive power of the digestive canal. In the young and vigorous, where the muscle fibers are elastic and the nervous system unimpaired, little fear need be entertained that a meal will be cared for at any hour, though habitual overindulgence in eating at unseasonable times, like any other abuse of the bodily functions, will enact its toll of punishment sooner or later. In the aged, however, or those with sluggish motor force, or hyperesthetic nerves, it is best not to place too much work on the stomach and intestines during the hours allotted to sleep.

A certain amount of food in the stomach, the digestion of which, in drawing from the brain a portion of its blood, keeps busy the nerve centers concerned and indirectly quiets other nerve centers which otherwise might exert a wakeful influence. Many sufferers from insomnia well know the happy effect produced by drinking a glass of hot milk or cocoa or eating a light repast just before retiring.

The following are some general suggestions as to dietetic recommendations in relation to sleep:

The young infant cannot get too much sleep, and this is best attained by filling his stomach at stated intervals.

Vigorous, growing children, and those engaged in manual labor thrive on a full breakfast and lunch, these two meals containing most of the daily quota of proteins. The evening meal may be plentiful in quantity, but should consist of such articles as bread, milk, cereals, eggs, fruits, etc., which do not unduly stimulate the nerve centers by their metabolic products. Soups, rich extractives and solid proteins also cause the bladder to be filled with urine, rich in waste products and very acid, this being a factor worth considering.

Those who labor with their brains, or skilled artisans whose crafts demand mental tension with but little muscular effort, will find their efficiency best subserved by a light breakfast, a slightly more plentiful lunch, and, at the close of the day's work a generous meal, provided that after it two to four waking hours are allowed, so that the psychic reflexes may have an opportunity to contribute their share to the processes of digestion.

For the leisure class, those human butterflies who keep late hours and are perhaps the votaries of Terpsichore, Bacchus, or Venus, it is advisable to take a light repast in bed at 10 to 12, a hearty dinner at 5 to 8, and a moderate supper, with not too stimulating or alcohol-containing beverages at 11 or 12.

The foregoing suggestions are intended to be elastic, requiring such changes as may fit individual habits or environments, and the thoughts herein are offered as a small contribution to an interesting and not too well understood subject.

DISCUSSION

Dr. Julius Friedenwald, Baltimore, Md.—It might be of some interest in connection with Dr. Niles' paper to call attention to some observations made by me some years ago regarding the effect of rest, sleep and exercise upon gastric digestion.

(1) Under normal conditions the secretory as well as the motor functions of the stomach are not interfered with during rest. During sleep

after meals, however, the secretory function remains normal, but the motor function is slightly disturbed.

(2) In cases of hyperchlorhydria with normal motor function, the acidity is reduced and the motor function remains normal while resting, whereas during sleep the acidity remains about the same and the motor function is impaired.

(3) In conditions of hyperchlorhydria with motor insufficiency the acidity is lessened and the motor function impaired during rest, whereas during sleep the acidity is still further decreased and the motor function still further impaired.

(4) In conditions of hypochlorhydria with normal motor activity the acidity seems to be increased and the motor function remains normal during rest, whereas during sleep the acidity is increased and the motor function is disturbed.

(5) In conditions of hypochlorhydria with diminished motor activity the acidity seems to be increased and the motor function improved during rest, whereas during sleep the acidity remains about the same and the motor function is interfered with.

From these observations it appears that in conditions of gastric disturbances accompanied by hyperchlorhydria and hypochlorhydria and in motor disturbances of the stomach, the gastric digestion is improved during rest, but impaired by sleep after meals.

Dr. A. W. Calloway, Asheville, N. C.—Dr. Niles mentioned exercise as one of the things to induce sleep, but he did not emphasize it as much as I thought he would. Patients require rest the first hour or two after a meal. Fatigue toxin is supposed to induce sleep, whereas Austin toxins cause insomnia. It is said that Napoleon Bonaparte suffered with gastric ulcer and was a poor sleeper, and while awake he planned his battlefields and battles. I have noticed that after a hard week of fishing or hunting there is complete relaxation and a period of sleep follows. I do not believe we can accentuate too much the value of active exercise and sometimes extremely active exercise in producing a condition of sleepiness.

Dr. Tom A. Williams, Washington, D. C.—I wish to exhibit myself as an illustration of congenital insomnia, having had a great deal of experience in dealing with cases of insomnia. I have been extremely interested in this subject, having studied the causes of insomnia in a great many cases, including my own, that of my father and own boy, all of whom are insomniacs. I have had about three hours' sleep in two nights while attending this meeting. We know that some people will sleep on a full stomach and others will sleep on an empty stomach, and still others can be made to sleep by exercise. Other people remain wakeful by exercise, and still others remain wakeful on either a full or an empty stomach.

There are rudiments of logic laid to the state of Napoleon's stomach which have nothing to do with sleep. There must be something else. For instance, a warm bath will induce sleep in some people, whereas in others a warm bath creates wakefulness. We know that in states of intense nervous excitement, as before some great ordeal is to take place, men will be unable to sleep, and the reason may not be psychic. It may not be because these men worry about their problems.

Dr. Crile reported an observation made during the war at Mons, and a great many French physicians observed the same thing, that some of the men slept for thirty-six hours after their retreat, as for two weeks they had practically not slept. Some of the men slept through surgical operations, requiring no anesthetic.

Persons in a state of hyperthyroidism sleep very badly. They sleep in the morning perhaps, but it takes hours at night before they go to sleep. There are a great many other observations that might be made in the same direction. Hence my own general thought is that sleep is a function controlled metabolically through the endocrin system. It is a function of hyperproduction or hypoproduction of the endocrin substances that have to do with what Crile has called the "kinetic drive." When the kinetic drive is on, you cannot sleep. You must quiet the kinetic drive before you can sleep. Any procedure which tends to suppress or quiet the kinetic drive will lead to sleep, and a procedure which stimulates it will lead to wakefulness.

Speaking of my own case, I have to be quieted down before I can sleep. Hence, I sleep most soundly in the morning. I cannot sleep at bedtime unless I have tranquillized myself in the evening.

Dr. Seale Harris, Birmingham, Ala.—This subject is of great practical importance to physicians who are dealing with digestive diseases, because unquestionably the amount of sleep that one has and needs has a great deal to do with good digestion. In other words, it is emotional disturbances, as a rule, that prevent sleep; and we know that emotional distrubances affect the various secretory organs, and particularly the endocrin glands, including the suprarenals.

Perhaps some of you may have read the articles by Cannon on the emotions, in which he called attention to the fact that laboratory animals in a state of pronounced fatigue could not move their muscles; and that the injection of a very small amount of adrenalin would immediately restore the muscular functions. I am thoroughly convinced that loss of sleep has much to do with the adrenal function.

Another thing I have not seen brought up before is the probable effect of caffein upon adrenal secretion. I am assuming its effect from Cannon's experimental work in connection with stimulation of the adrenal gland. When you are fatigued, if you take a glass of Coca Cola, or a cup of water, it will enable you to attend to your duties and you feel practically well. Now, caffein is one of the greatest and best drugs we have to counteract fatigue, but used regularly it is doing great harm.

We do not know what sleep is. Some man has likened the human body to an electric storage battery. Some years ago I had an automobile which was run by a storage battery. When I put the batteries on charge and let them stay on all night the next day the car would run all day, but if I got the batteries only half charged at night, the batteries would go down before the end of the day. As long as the batteries were in good condi-

tion and properly charged, I could get along all right. When the batteries began to run down I would get a short circuit and the batteries would go down suddenly. It is much the same with the human body.

Since we now believe that the electron is the basis of all matter, it may be that the mechanism that rearranges the electrons has something to do with sleep, and the electrical reactions may have something to do with it.

As a practical proposition, I find many patients who suffer from digestive disorders because they do not get enough sleep. An important question we ask every patient is, what time do you retire? What time do you get up in the morning? How many hours of sleep do you get? The regulation of the lives of our patients is a very important function. When they get a sufficient amount of sleep they are not so apt to be troubled with disturbances of digestion.

As to sleep in relation to eating, Cannon has brought that out in his expermental work on animals. There is an inclination for animals to sleep soon after eating. Dr. Williams mentioned his own case. The best thing I do every day is to take an afternoon nap. I have a heavy meal in the middle of the day, and then I lie down for thirty minutes and sleep twenty-nine of them, and I awaken much refreshed. I have been doing that since I was a student at the University of Virginia, and I am uncomfortable when I do not get this sleep unless I take caffein in some form, such as coffee or Coca Cola. I find my efficiency is increased considerably by getting that rest.

I find a great many patients who do not sleep well at night because they become excessively fatigued during the day. I find that I do not sleep so well at night when I have missed this thirty minutes rest during the day.

As to the toxins of fatigue, a normal amount of toxins produces sleep. Too much exercise or excessive fatigue produces wakefulness and increases nervousness. If we will see that our patients get sufficient sleep, it will improve their digestion.

In the matter of duodenal ulcer, nearly all patients with duodenal ulcer give the experience of waking at 2 or 3 o'clock in the morning and of having pain at that time. In the early stages of duodenal ulcer this wakefulness in the early morning hours is a suggestion that there may be hyperchlorhydria.

Dr. Crile found in laboratory animals that when the adrenals were removed a large number developed duodenal ulcer. Several years ago I called attention to the fact that duodenal ulcers developed in patients in a state of chronic fatigue, so that the observations of Crile on removal of the adrenal gland tally with those of my own, and I believe the adrenal gland may have something to do with the function of sleep.

Dr. George L. Echols, Milledgeville, Ga.—Kant suffered with gout. Kant was an unusually brilliant writer. Personally he was much humiliated because he could not sleep on account of this gout. As the loss of sleep weighed heavily on his mind, he proceeded to write on the subject of sleep, and I believe that is the real origin, the first scientific thought in regard to sleep that influenced the medical profession. After Kant died, Wetherstrand, of Berlin, a young physician, saw that his brother physicians were turning down a certain class of patients as not being worthy of consideration. Of course, you know the class I am referring to. He was influenced by the writings of Kant on sleep.

About that time the subject of hypnotism was brought forth. Wetherstrand made attempts to produce artificial sleep, as he saw sleep was one of the main troubles with the discarded class among his brother physicians at that time, and he thought he was getting somewhere by producing artificial sleep. The doctor who works along the line of producing something new, especially for a discarded class who are neurotics today and psychotics tomorrow, is trying to benefit humanity. Wetherstrand failed and died a young man.

In Berlin another man came on the scene who had high emotions, Sigmund Freud. Freud did not take very well to the iron clad way, and after working in Paris for a while he took up Wetherstrand's idea of producing artificial sleep, and found in attempting to produce artificial sleep by hypnotism that he was able to get into the lives of his patients. They talked to him freely and told him of their troubles in life from a psychogenic point of view. Thus we have the School of Freud. We are not all Freudians. The Freudian School took up other ground, and the field is now being well worked. The lesson to be drawn is that this movement had its origin in man's study of the state of sleep.

Dr. Henry C. Clark, Falmouth, Ky.—In the first twenty years of my practice I could go to sleep riding horseback, and I have done it many times, but after you have passed the age of 50 you cannot lay aside your cares so easily, and as long as you have anxiety and things to worry you, sleep will not come. It is true, the use of drugs may help, but not as much as one would think. One should do those things that will bring real rest, and if you have real recreation you will have no trouble in sleeping. I have practiced along these lines for many years and find that I have very little trouble in getting sleep.

Dr. Niles (closing).—Byron went all through life suffering from insomnia.

Old Sancho Panza, after a strenuous session with Don Quixote, covered himself with his cloak and had a long sleep, and when he got up and stretched himself he said, "God bless the man who first invented sleep."

We all feel grateful for that restful attribute in treating our patients as human beings. Anything we can do to help them sleep, to get away from the troubles and stress of daily life, will benefit them. Those who have the least trouble and the least worries sleep best.

"Tired nature's sweet restorer, balmy sleep!
He, like the world, his ready visit pays
Where fortune smiles—the wretched he forsakes."

But to look at it from another side,

"Early to bed and early to rise,
It is all very well for sick folks and guys,
But it makes a man miss all the fun till he dies,
And join the stiffs who have gone to the skies.
Go to bed when you please, and sleep at your ease,
For you'll die just the same with some Latin disease."

EFFICIENCY OF THERAPEUTICS*

By W. R. Houston, M.D.,
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In discussing the question of advancing therapeutic effectiveness I shall limit myself to its economic aspects. An important way of estimating the value of the physician's labors lies in reckoning the number of working days that his efforts have added to the communal accomplishment. It is true that much of his task is to alleviate and to console. We esteem the worth of energy spent in bringing comfort, but for this worth there is no measure. We are, however, justified in inquiring into the economic value of the physician's labors.

Economists and statisticians, by a general consent, have arrived at the figure $100.00 as representing the average value of a human life per annum to the community's wealth. The lives of infants and the infirm constitute a liability, of course, rather than an asset, but this figure includes the entire population. The average length of life in the registration area was in 1870, 25.2 years. In 1922, it is given by the United States Census Bureau as 55. In five decades there has been an increase of 30 years in the average length of life, or of $3,000 in the value of each individual in the community. For the population of 108,000,000 we arrive at an increment in the national wealth of $324,000,000,000, or sixteen times the national debt, an amount on which the interest at 5 per cent would suffice to give each doctor in the country an income of $15,000 a year.

In 1909, 13 days was considered to be the annual loss from illness per person. This has now been reduced nearly one-half and this represents an annual saving that is equal to about three times the total value of the cotton crop.

Just how the causes of these gains are to be distributed and just how the relative contributions to the resultant sum are to be appraised cannot be known with precision. Decrease in tuberculosis mortality has added about 3½ years to the average life with a relative decrease in the number of sick days. Decrease in infant mortality is a very large factor. Saving one infant who attains average age increases the average longevity as much as saving ten persons of the age of 50. These are splendid and heartening results. We cannot reflect, however, on our own daily work in relation to such achievements without being impressed by the idea that most of these gains have not been brought about by direct action. It is not our response to the calls that the sick make on us that has prolonged so greatly all these lives and banished all this sickness. The gain has come about certainly through the application of knowledge that originated in the medical profession. Most of it has come through the general diffusion of this knowledge. "In our Century," said Pasteur, "science is the soul of the prosperity of nations and the living source of all progress. What really leads us forward is a few scientific discoveries and their application."

The most important work of the internist is educational. The greatest demand on his time and strength is in the cause of educating people. What is the worth of a physician to the community may be answered by asking how effective is he as an educator. All day he is teaching mothers to care for the young. He is instructing the cardiopathic, the arteriosclerotic and the diabetic in the rules of hygiene and dietetics. He is re-educating the neurotic. He is instituting in the home of acute infection the practices of cleanliness, quiet and proper nutrition. He teaches largely by the best of all methods, example, and as the examples multiply his task grows easier. Each pupil becomes a focus of enlightenment for others. It is not nearly so hard as it once was to teach a typhoid that he needs food and not medicine, to induce the tuberculous to rest and the diabetic to diet.

If, then, we pause to consider how we shall make our therapeutics more effective, we must ask ourselves how we shall make our teaching more effective. The doctor is from his name a teacher. He

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cannot drive people into what he thinks best. He can only enlighten their self-interest. But he enjoys the tremendous advantage of teaching a subject which, for all their prejudices and misconceptions, they are most eager to understand.

The following are the points of view which I believe to be of most importance to emphasize in our relations with our patients:

(1) That we are less doctors of medicine, persons to whom one applies for a specific remedy for the cure of his ailment, than councilors concerning health. Therapeutics teaches the method of adjusting oneself to a limitation. In a few instances there are specific means of doing away with the handicap altogether. But in most instances it is a question of rearranging the life of the patient so that he may most successfully combat or make terms with his limitation.

(2) It would be greatly to the interest of our patients if we would lay aside any pretension to originality in the advice that we offer. The tremendous advantages that have accrued from the standardization of medical schools and the standardization of hospitals can most advantageously be sought by the internist through the standardization of his methods of treatment. We often hear that treatment must be strenuously individualized. While there is a degree of truth in that, a far more important truth is the need of definite standards of treatment. The belief is justified that our patients would fare better on the whole if all of us treated diabetics exactly as Dr. Joslin does, if we treated nephritics exactly as Dr. Christian does, if we treated pneumonia as Dr. Cole does, malaria just as Dr. Bass advises, tuberculosis according to the teachings of Dr. Lawrason Brown. It is my belief that much aimless groping and ineffectual effort might be spared if we had standard methods of treatment laid down for all the ordinary infections, typhoid, pneumonia, scarletina, diphtheria, etc. Like the standard treatment which has been so advantageous in the cure of malaria, there might be set down what constitutes an irreducible minimum for sound practice of other diseases. Committees from a body like this might formulate in the briefest words the few uncontested essentials of our present knowledge as a basal requirement of practice. This would be the safe, ready guide for the legions of every-day practitioners. It would not, of course, infringe upon the field of the few original investigators.

In educating our patients as to what they may properly expect from the physician, we shall gradually bring them to understand the important problem of when they should consult him. They will insensibly learn that the "ounce of prevention" is worth more nearly a ton than a pound of cure. They will learn as regards the physician what they have already learned regarding the dentist: to consult him at stated periods without waiting for the ache which demands relief. The insurance companies, which have been a tremendous factor in the education of the Nation in health matters, are finding it to their economic advantage to have a most thorough overhauling of their policyholders annually or semi-annually. Individuals will not be slow in perceiving that a similar course will be even more to their personal advantage.

(4) There is a great need of more faith as to the possibility of educating people to receive the very highest standards of advice that we can give. The idea that we are obliged to humor people with placebo is a barrier to progress. The grave serious wrong of needless drug-giving, however harmless the drug may be, is that it diverts the patient's attention from grasping the real issues. The readjustments in his way of living that are essential are neglected in favor of taking the drug which is of little or no importance. It is often remarked that it is agreeable to have a patient in the hospital because there we are not obliged to give medicine. As a matter of fact, if we, in the matter of acute infections, write out painstakingly the details of nursing and diet as these are carried out in the best hospitals, we will find people quite content to follow this plan of treatment. Our yielding to the demand for drugs is more the result of a serious lack of energy on our part than because of the patient's insistence on drugs.

It is not, however, in treating the acute infections that the most successful efforts of therapeutics are seen. With a few striking exceptions such as malaria and diphtheria, the acute infections are very little influenced by medical efforts. Beyond establishing a well-ordered nursing routine and proper dietetic measures, along with such palliatives for pain and discomfort as the occasion may suggest, the physician's main business is to look out for surgical complications. Neither the mortality nor the duration of the sickness is likely to be influenced greatly by therapeutics. It is in dealing with the chronic diseases of internal medicine that the highest skill of the therapeutist is required, and it is here that his greatest opportunity lies. It will require nice discrimination to determine how far he needs to call in the aid of the surgeon to remove foci of infection and other handicaps to health that lie in the surgeon's domain. After all that is done, however, there will remain a great mass of persons, constituting, according to statistics that became available since the late war, a great proportion of those that have reached middle adult life, for whom an enormous amount can be done if we can succeed in securing their intelligent cooperation. These are the patients somewhat impatiently referred to by active practitioners as "old chronics."

An overwhelmingly large proportion of the failures in treating chronic diseases are failures of morale. These failures are not most often due to diagnostic error. Successful treatment does not flow inevitably from correct diagnosis. They are not due to false conceptions of the general course to be followed. They are due to failure of the patient's will and the physician's stimulating influence. The tuberculosis patient, when his disease is nearly arrested, loses interest. The diabetic wearies of his diet and the syphilitic, when the always-diminishing factor of fear has subsided, tries to forget his doctor and his mercury. The morale of the doctor is often as frail as that of the patient. He would like a new problem to solve. He finds it difficult to maintain the aggressive enthusiasm with which he first attacked the case. He must still crack his whip over the lazy patient's back to make him pull up the hill to cure or comfort.

It would be too sanguine to hope to eradicate the inevitable and inherent frailty of human nature. The plan so popular in Europe of taking yearly an intensive six weeks' cure at a watering place is a helpful adjustment to this frailty. Yet I have found two procedures of great value in attempts to overcome this, the most formidable of all barriers to therapeutic success. The first is the keeping of a card index follow-up, by the use of which at the appointed month and day the patient is reminded by letter or 'phone to report for a review of his case. This plan is of especial value with the milder diabetic and tuberculous cases. The patients do not suspect the physician of endeavoring to create business for himself. They generally show a lively appreciation of the interest taken and are grateful for the impulse given to their flagging zeal. Curiously enough, men respond more readily to an appeal made to the economic value of their health capital and its conservation than they do to arguments based on the enjoyment of life and health. This puts in their hands their own familiar measure of values. The second means of estimable value in maintaining the morale of those having chronic disabilities lies in having them keep a health book. In this book the physician first writes down in detail the plan of treatment to be followed and furnishes an example of the kind of notes that are to be kept day by day. I have found that wherever a patient can be induced to be faithful in keeping this book the best results possible in the case may be expected. It is astonishing what excellent and informing records we often get in this way, records that would put many hospital charts to shame. Especially with psychoneurotic patients the system and method which the bookkeeping brings to the disordered mind is a most salutary and saving influence. The cures which are accomplished by the patient's own efforts in the home environments are far more stable and lasting than those made in the artificial and pampering atmosphere of the hospital. The

patients acquire strength from having proved themselves sufficient to solve their own problems.

Summarizing, then, I would say that to make the therapeutics of internal medicine more effective we need to emphasize, above all, the educational aspects of our work; to teach our clients what they can properly expect of physicians; to standardize our methods of treatment; to teach preventive medicine in chronic diseases; to study ways and means of maintaining the morale of the patients by giving them acute cure periods and by following them up and inculcating the systematic methods of the hospital in their private homes. The day is long past when the doctor was merely the lackey to my lord's bladder and bowels. For therapeutic effectiveness we must have an exalted sense of leadership and a disdain for any yielding to the demands of ignorance and prejudice. The evangel that we spread in quiet ways by council and demonstration, the evangel of scientific enlightenment, has done and is capable of doing more to ameliorate men's condition than any agency now at work.

DISCUSSION

Dr. Virgil E. Simpson, Louisville, Ky.—It has been said that medicine is a science that somewhat heals, that often relieves and always comforts. If that be true, and I take it in the main it is true, we can never get away from the purely personal relationship that must and should obtain between the patient and the doctor. I do not believe that in the essayist's plea for standardization he had in mind the disturbance of that relationship, but rather he tried to emphasize the necessity for what he very aptly phrased the irreducible minimum. It seems to me, if the medical profession would from time to time take stock of some of the things which constitute the irreducible minimum in the management of cases that present themselves to us in our daily work, we would find much less of the heretofore apparently unescapable differences of opinion that confront us not only in medical society meetings, but in consultation work in the patient's home.

This paper would serve an equally good purpose if presented as a part of a public health service, county, municipal, state or national. The only danger that one sees in a doctor's attempting the role of educator is that we have unfortunately a not negligible per cent of men and women in the medical profession who are themselves not stable, who tend to become faddists, and the faddist as a medical man or medical woman is very dangerous. One may become obsessed with the idea that his duty consists in the management of any condition, and he may become so highly specialized that he fails to realize there are other causes of complaints, other symptoms of diseases than those which are referable to the particular part of the human body to which he has attached himself. Every man should steer clear of the tendency to ride hobbies which will exclude from the clear field of vision some of the things that are quite as essential as those which constitute the hobbies.

I believe one of the most important things that the medical profession should undertake to do in establishing this irreducible minimum is to try to educate the public along the lines of preventive medicine. It is of great importance to the members of a patient's family for us to render such scientific aid as may tend to restore, as soon as possible, the individual to health, but we render larger service to the community in which we live if we prevent children from developing diphtheria instead of administering all the aid we may to the one who has become stricken. The physician occupies an anomalous position. The public seeks and accepts his advice when ill, but looks askance when he advises it how to stay well. His voice is, indeed, one crying in the wilderness when he talks preventive medicine, a labor entirely altruistic save to the salaried health officer. These latter can do much good, but they tend to become faddists; they become prone to minimize therapy in an emphasis of prevention. Either extreme should be avoided.

Dr. Seale Harris, Birmingham, Ala.—Weir Mitchell relates in his book on "Doctor and Patient" that one of his patients asked him, "Doctor, how would a doctor two hundred years ago have treated a case like mine?" Dr. Mitchell went to the library and got all the books he could find that were written by doctors two or three hundred years ago, and he found that doctors at that time gave specific directions regarding the daily routine of the patient and diet, and he concluded that the best doctors of all time are those who regulate the lives of their patients so that they may be restored to health and continue to remain in health.

Dr. Houston brought out the importance of regulating the lives of patients. Of course, diagnosis is important, and we have not gone too far in making diagnoses, but the criticism has been made that a doctor will spend three or four hours in making a diagnosis and only three or four minutes in telling a patient what to do.

It is very important to get specific information regarding the patient's daily life. We should have routine questions to ask patients for this information. If you have not you will overlook important things that may have brought on the condition. We must find out the cause of the condition and then attempt to remove it. Too often we find loss of sleep is an important cause of this or that condition. We should ask patients what time they retire, and how many hours they sleep. Overwork or chronic fatigue is the most important predisposing cause of many of the acute infections as well as chronic diseases, and it is an important matter to know how many hours' work these patients do. Women who work fifteen or eighteen hours a day cannot get well until they are taught how much work they can do each

day. A thorough anamnesis is very important, and a thorough diagnosis is important to get the confidence of the patient, and when you have finished the diagnosis it is important to remember that you have a patient who knows nothing of personal hygiene or very little, and you must teach that individual how to live so that he can be restored to health and maintain health.

A great deal may be done in regard to educating the public before it becomes ill. The doctor of the future will be the man who examines people before they are sick, and after an early examination instructs them how to live.

We are very fortunate in having with us this afternoon the director of the Life Extension Institute, of New York, Dr. Fisk. This institute is doing a wonderful work to educate the public to the importance of having semi-annual examinations. I move that the privileges of the floor be extended to Dr. Fisk.

Dr. Eugene L. Fisk, Life Extension Institute, New York, N. Y.—We have heard the word diagnosis mentioned many times. It is one that I do not like very much. We should study the individual, his body and his life, and with a clear picture of the whole before us counsel him. In this way we have the best possible protection against the faddist. In our own profession, in preventive medicine, we have the faddist. Too much emphasis is often laid on one phase of hygiene, diet or exercise. When we analyze people for the purpose of preventing disease, carefully examine their bodies and lives periodically and dispassionately for the purpose of prolonging life, and not for the purpose of making a diagnosis to treat a particular disease or ailment, experience shows a definite reduction in the death rate.

Some of you may have seen a recent cartoon issued by the Life Extension Institute, in which every type of worker in medicine and hygiene is pictured as having his own place in the fighting line against disease, and another cartoon expressing the opposite idea of the faddist or quack, the man with a medical fad, or the quack with a purely commercial fad, claiming his own method as a cure-all. Some of these health fads are splendid things in themselves and within their legitimate field. There is always an element of truth in every fad. We must seek that grain of truth, wherever it may be, and then arrange a well balanced program for an individual in which each measure is carried out in right proportion.

Mention has been made of gains in longevity. Most of the gain has been under the age of five. We have added about eighteen years to the expectation of life at birth in the past Century. In twenty years we have had a most wonderful gain, but mostly among the younger ages. There has been no extension of human life or increase in the expectation of life at the age of 50. The so-called degenerative diseases have been on the increase. Following the influenza epidemic there was a temporary reduction, but these are again on the up-grade, and there is the most important field of work. We must begin in prenatal life and so on through natal life in adolescence and adult life to correct the troubles we meet in middle life. I believe the essayist is right in predicting that the physician of the future will be a health councilor, and his task that of life adjustment. But he may have to examine a whole family before he can adjust an individual member of it.

Dr. D. C. Walt, Little Rock, Ark.—The education of the patient is as necessary for satisfactory results as any other part of the doctor's work.

We must not forget the fact that we are animals and subjected to the same natural law as all other animals. We are disturbed more by civilized law than any other animal. We need more care each day than any other animal, and we usually get less. We should study health as well as disease.

The idiot has an appetite, taste and hunger.

Regardless of our intelligence, if we don't use it we place ourselves in the same class as the idiot. We should feed and drain more to effect than by weight and calories. It is each day's active care (everything else being equal) that makes the best horse, the best farm, the best railroad, the best business and, necessarily, the best man.

THE MENTAL DISEASE PROBLEM*

By George L. Echols, M.D.,
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In recent papers on this subject, I have tried to stress the problem by referring to a few facts, such as:

(1) More than one-half of the hospital beds of the country are occupied by individuals suffering from mental disease.

(2) About 50 to 60 per cent of the inmates of penal institutions are suffering from mental disease or defect of some form or type.

(3) Of the ex-service soldiers now hospitalized, one in three is a neuropsychiatric patient.

(4) From one-tenth to one-fifth of every state's expenditures is for the support of mental hospitals.

(5) There are more mental patients in our public institutions than there are students in our colleges and universities.

(6) The individual and family economic loss from mental disease can hardly be estimated.

(7) A person requiring hospitalization from a neurosis or psychosis is just as

*Read in Section on Neurology and Psychiatry, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

much incapacitated and has a disease just as real as another person with a fractured leg, pneumonia, typhoid or tuberculosis.

We are face to face with a problem of vast importance, economic, social and humanitarian.

In May, 1921, Massachusetts amended her law relative to the examination of applicants for registration as physicians by adding psychiatry. Thus her State Board examinations include mental diseases along with the other subjects such as anatomy, physiology, pathology, obstetrics, gynecology, surgery, etc. This amendment goes into effect in July, 1923.

Every state in the Union will follow the above example, and is there any special reason for delay? Last school term, "only five medical schools in the United States were giving instruction during the pre-clinical years in the processes of the mind and their modification in disease."

With the above amendment in force, all our medical schools would necessarily give courses of instruction in mental disease with as much thoroughness as their courses in medicine, surgery, obstetrics, etc. This would result in one or two generations in a medical profession in which all doctors, regardless of specialty, would have a reasonable working knowledge of mental diseases.

At present those familiar with mental diseases are a few specialists in mental and nervous diseases in the larger cities and those on the medical staffs of mental hospitals, private and public, the latter including the larger portion of the group. The patients seen in our mental hospitals are usually of an advanced type who have committed some unusual act or had an episode necessitating commitment. Practically all our literature on mental diseases is from studies of the fully developed psychosis. Even in the advanced stage much can be done for the patient. But our great hope in the mental disease problem lies in preventing the psychosis or curing it in its earliest stages.

In private correspondence dated September 26, 1922, Dr. C. Mcfie Campbell, Director of the Boston Psychopathic Hospital and Professor of Mental Diseases at Harvard, advised the writer as follows:

"The great progress in the practical handling of insanity will lie, not so much in elaborate studies of the end product, but in the general diffusion of psychiatric knowledge among the general profession, so that the patient will receive some sort of treatment months or years before the present stage at which they usually receive treatment."

This leads us to a consideration of the pre-psychotic and early psychotic periods. The paper read before the 1922 meeting of the American Psychiatric Association by Dr. Douglas A. Thom[1] shows that these tendencies can be observed in some cases even before the usual school age; and as I understand from the discussion, the phobias, neuroses and psychoses of childhood are going unnoticed and with little or no consideration. At the above mentioned meeting, a paper by Dr. George E. Hyde[2] shows that in a survey of more than fifteen thousand school children, 1 per cent of the school population were classed as nervous and excitable. It is further pointed out that the moron can be recognized before the period or age of delinquency. The studies of Dr. A. F. Tredgold[3] indicate that the mentally deficient is twenty-six times more liable than the normal to develop mental disturbance. Perhaps future studies will demonstrate that one of the great fields in preventive medicine lies in proper psychiatric studies of school children. The big idea is to prevent the nervous, unstable, excitable or feeble children of today from becoming the psychotic adults of tomorrow. And a great question is, how can this group be prevented from propagating their kind into the coming generations? Our daughters are not only not being educated to become good mothers, but are being educated in such a way as not to become mothers at all. The bulk of our future generation must come from the feebler element of the race which propagates rapidly, thus sowing the seed for more feeble-mindedness and mental disease. Just how much industrial disturbance is due to early and unrecognized mental disease can be determined only by future psychiatric indus-

1 and 2. American Journal of Psychiatry, July, 1922.

3. Tredgold, A. F.: Mental Deficiency. Wm. Wood & Co.

trial studies. In the beginning of this paper we mentioned the relation of our problem to penal institutions and the deplorable feature is that the defect is usually not noted and no steps are taken to prevent the individual from committing the crime.

Time permits us only to mention organic lesions. Ten per cent or more of our population are syphilitic. Syphilitics are potential neuro-syphilitics, and every neuro-syphilitic is a potential case of mental disease. Syphilis is preventable. What is true of syphilis is true of many other organic lesions and certain toxins which lead to mental disease.

The public must be gotten away from the fatalistic and pessimistic impressions of mental disorders. It must be led away from the old asylum idea and be given a vision of the hospital for mental disease. We must get away from the thought that an individual is insane or crazy, and regard him as mentally sick. We as physicians must grasp the truth that there are many types of mental diseases, and that they are about as treatable as physical diseases.

Some of the present methods are nothing short of deplorable: jails and asylums, and to reach the latter, the mentally sick has only one route—police station, sheriff, jail and court. If a man is mentally sick or has a psychogenic or organic trouble, his disease is as real as nephritis or tuberculosis. He is by the law branded as crazy, taken in custody by an officer, passed through a court or commission trial to make his incarceration legal; and by the time he reaches the institution physician he is suspicious, non-cooperative and rebellious. The institution physician is burdened with two or three times as many patients as he should have in his care, and this usually necessitates hurried examinations. At stated intervals the patient is re-examined and his conduct noted. The patient is left to a great extent to associate with the chronic insane, and he naturally loses hope and interest.

There should be established mental clinics in the large cities, and certainly an out-patient department at every state hospital. With our improved facilities for rapid travel, why not let the patient be brought or come voluntarily to the mental clinic or out-patient department where he can be examined, observed and his troubles talked over, to receive expert advice as to rest, treatment, commitment, etc. The recoveries in these mental clinics would be surprising. In case a commitment is advisable, let it be voluntary as far as possible. Let the patient come into the mental hospital with the full realization that he is mentally sick and the great consideration is mental improvement or mental recovery.

At present most of the attempts to treat mental disease are in institutions, private and public, but this is little more than an attempt to salvage the human driftwood at the mouth of the river. My plea is for a medical profession to prevent the young timber from falling into the headwaters of this horrible stream of mental disorder. What can be done, time and work will tell.

Dr. Osler became interested in this subject in his late days, and in the eighth edition of his book on "Principles and Practices of Medicine," one-third of its pages was devoted to nervous and mental diseases.

William James, Professor of Psychology, became enthusiastic and made the statement:

"If I were a millionaire with money to leave for public purposes, I would endow insanity exclusively."

Harvey Cushing recently said:

"There is nothing which is possibly of more concern to the Nation than a knowledge of the mental disorders to which its citizens are subject."

Listen to the inspiring words of Henry Van Dyke:

"To prevent the spread of mental disease and to reduce the number of insane in our country is a work of the highest and most patriotic service."

William H. Welch, Johns Hopkins, says:

"The greatest need is for improved care and treatment of early and curable cases of mental derangement and of borderland cases which can be prevented from passing into the insane state; also for better instruction of students and physicians in psychiatry."

In conclusion, my plea to the medical profession is to take up the study of mental diseases. Buy text books on the subject, study the mental disease problem,

and help lay the foundation for a medical profession, one or two generations from now, that will have a working knowledge of the subject. Mental disease is on the increase, and the longer organized efforts to deal with mental disorders are deferred the greater will be the problem.

SUMMARY

(1) Mental diseases is a staggering problem, economic, social and humanitarian.

(2) Mental disease is apparently on the increase.

(3) A person requiring hospitalization from a neurosis or psychosis is just as much incapacitated and has a disease just as real as another person with a fractured leg or pneumonia.

(4) The most treatable and curable stage is in the pre-psychotic and early psychotic periods.

(5) It is the family physician and the specialist in every specialty who sees the patient in the above-mentioned treatable and curable periods.

DISCUSSION

Dr. R. C. Swint, Milledgeville, Ga.—We cannot divorce mental problems from physical problems. We must learn to study the human organism as a whole. We owe a great debt to modern physiology because of the emphasis it has placed on the interrelationship between the different organs; for instance, the relationship of the functional activity of the lung and the heart to respiration and circulation, etc.

The question of prevention takes us into the domain of eugenics. We have to consider the problem of the prenatal life of the child. We have to consider the problem of the child in the preschool age. We have to consider the problem of the child in school life. There is the question of habit training in childhood. There is the question of the individual after school life. We send our children to school, we stuff them with information pie, and they develop mental indigestion, but we do not spend much time in our curricula in teaching our children how to meet the problems of life from their instinctive standpoint; how to adjust themselves when difficulties come up. The question of mental diseases taxes the capacities and resources of the medical profession as no other specialty does. For an individual to be a successful psychiatrist, he has to be a well-rounded, well trained man. We do not expect the general practitioner to become a specialist in mental diseases, but what we should do is to so formulate our theories and ideas in relation to these things that it will be within the grasp of the general practitioner to understand the behavior disorders as manifested in the types of personalities that are predisposed to mental disorders, so that through their early recognition these cases may be apprehended and given the proper treatment.

Dr. M. L. Graves, Galveston, Tex.—After years of experience, starting twenty-five years ago with the superintendency of one of our state institutions for the care of the insane, I have no faith in any solution of these problems except from a scientific standpoint. Governmental and political domination of the institutions devoted to the care and welfare of the mentally defective and mentally diseased presents, except, here and there, in rare and exceptional cases, no real work of a constructive character. Little work that tends to give us any adequate explanation of the etiology of mental diseases comes from these institutions.

Twenty years ago or more I was informed that Dr. Osler had urged that the American Medico-Psychological Association should constitute itself a scientific section of the American Medical Association in an effort to connect its administrative work with a larger degree of actual scientific work in the endeavor to solve the mental disease problem. Owing to the fact that the administrative details and other considerations were so great, the suggestion was not adopted. And so I feel the problem has suffered during all these years through a failure of the states to provide adequately for the study of the subject, and because of the fact that the states, for the most part, see patients only in the terminal stages, when the pathology is a terminal one complicated by other diseases. Today there are very few states in the Union with an adequate state laboratory for the study of the pathologic anatomy, the biochemistry, or morbid physiology of the mental disease cases coming to them. I welcome with a great deal of pleasure the work that has been brought to our attention this morning by the preceding speaker in the anatomical study of one phase of mental disease, dementia precox, and I trust that this work will be extended all over the country until light comes from many sources.

The Doctor referred to the hospitalization of soldiers, saying the mental disease problem has been complicated by political changes and that these changes are beginning to take on more and more of a political aspect. One in three of the soldiers being hospitalized is a neuropsychiatric patient. A very large number of these cases do not need hospitalization at all, and if they were studied from the standpoint of science instead of that of political expediency, partisan advantage or votes, we should have a larger contribution to science. Many of these cases should be under medical care or in industrial and administrative fields rather than actually hospitalized.

Some of the medical colleges have fallen in line with the suggestions that have been made by the essayist this morning. Some colleges even in the sophomore year begin the study of normal psychology in lectures and demonstrations to students, and during the period of the junior and senior years these are extended into

more elaborate courses in abnormal psychology and finally into mental diseases. But few medical colleges have gone into medical instruction in psychiatry sufficiently to give its graduates a good foundation in a modern knowledge of these diseases.

The establishment of clinics, as the author suggests, in state institutions and outside clinics would meet a very small proportion of the problem because of the small number of institutions covering large territories.

Dr. Ralph N. Greene, Jacksonville, Fla.—In the beginning of my service at the Florida State Hospital, a number of years ago, we had 740 patients. The Hospital is located in a remote rural district far removed from the opportunity of consultations and conveniences enjoyed by hospitals in more populous centers. The Florida State Hospital operated from 1878 to 1909 without record of the performance of a single major surgical operation, during which time some patients must have suffered severely for want of it. In 1909 the institution had a medical staff of four physicians. The Hospital being remotely located, it has not been brought prominently into the public eye. Until very recently it operated with a patient population of two thousand and a medical staff of three physicians. A fourth has been recently added.

In Florida we have not a single general hospital provided with psychopathic wards, nor is there a general hospital in the State that routinely admits mental cases.

We have come to the realization that the insane asylum physician, in caring for mental diseases, becomes removed from other specialized branches of medicine, and we are beginning to believe that the mental case should be sent to the insane asylum only after a sojourn in a psychopathic ward of a general hospital. During his time in the general hospital he should be subjected to a critical medical, surgical and laboratory study and his correctable defects should be properly attended to. He should then be sent to the state hospital for the insane, if his mental symptoms continue, where he could reside in an atmosphere of rest and isolation and recover. Under these conditions, time and not the doctor is the principle determining factor.

I am of the opinion that eventually states will recognize the necessity for providing facilities whereby cases of acute mental disease may be first handled in a general hospital. They can, under these conditions, get more thorough and satisfactory care, and the early recoveries thus accomplished would not only save money but enable the patient to avoid the odium of having been sent to an insane asylum.

The care of the insane has been along lines entirely too stereotyped and there can be no harm in attempting a new plan of treatment which may produce satisfactory results.

Dr. M. A. Bliss, St. Louis, Mo.—The first of this year the National Committee, financed by the Commonwealth Fund of New York, proposed a plan for reducing juvenile delinquency in this country by sending out trained groups, a secretary, a psychiatrist, a psychologist and a social worker, to cities that would give them proper encouragement. St. Louis offered a good deal in the way of cooperation by probation officers of the Juvenile Court, and a group came to us in April. They examined all children that came to the Juvenile Court. They investigated the problem child from the public schools. They examined the problems from all social agencies. They went into a very thorough, well-rounded examination of all these children. It is essentially a child behavior clinic.

We are just now putting over an ordinance establishing this as a permanent part of our city plan, and we expect to correlate it. We should like to make it available for considering the problems of the public schools and of the big social agencies. I believe the idea will spread because a psychiatric clinic like this, amply financed, correlated with the social agencies as well as the public schools, cannot help following the suggestions given by the essayist this morning.

Dr. R. B. McBrayer, Sanatorium, N. C.—I would like to report some work the North Carolina State Sanatorium for Tuberculosis did a year ago which has not yet been reported. We moved the laboratory temporarily over to the state institution for wayward girls. The only reason I mention this is because these girls are believed to have an abnormal phychology. We have not studied them from a psychological standpoint or from a phychiatric point of view because we do not know how to do that as it should be done. We duplicated the basal metabolic rate determinations; we duplicated the blood sugar determinations and physical examinations. In about fifty of these girls, who showed the highest mentality, we found that nearly 50 per cent varied from the normal basal metabolic rate; that is, nearly 50 per cent of these girls had over plus 10 or under minus 10. In the same girls we found blood sugar abnormalities almost invariably. We found some definite signs of mild hyperthyroidism in many of them, and in others we found, along with the laboratory work, sufficient evidence to make a diagnosis of probable disturbed endocrine function. That was about as close as I could get.

This comes close to the work you men are dealing with, although we have not reported it, and have not followed it up.

Dr. Nolan D. C. Lewis, Washington, D. C.—It is very essential for us to counteract the prevalent feeling among the laity that it is a disgrace for anybody to become insane or to show abnormalities of behavior in conduct. We must educate the public, first, through school teachers; second, the clergy; and third, through the press. Every physician can likewise do an immense amount of work along this line. If we can impress upon the laity that cases of mental disorder with their peculiar behavior are no more of a disgrace than a case of typhoid fever or pneumonia, but must be gotten to a hospital immediately while the disease is still curable, we shall have made a great advance.

No surgeon wants a patient half dead with appendicitis and so we as psychiatrists desire our patients as early as possible in the disease in order to be able to prevent regression and to prevent a permanent psychosis.

Scientists have over-emphasized the factor of heredity in insanity, and have belittled the enormous environmental feature as a causative element in the development of mental disorder, and this over-emphasis has produced a self-protective attitude on the part of the relatives of psychotic individuals. All of us as physicians should keep this in mind and avail ourselves of every chance to consult the school teacher or newspaper man and impress upon them that it is not a family disgrace to have a disorder of the personality developing therein.

Dr. J. W. MacQuillan, Chattanooga, Tenn.—If I were called upon to make an investigation of the real condition of a country, I should always go first to the psychiatrists and the neurologists and visit the institutions and see what provision had been made for the care of patients and what advances had been made in the science. If I wanted to make a prognosis about the business affairs of the State of Georgia, I would not go to the politicians and business men in Atlanta and get that expansive idea of what was going on there, but I would go to Dr. Echols, of Milledgeville, and ask him for his statistics, and I would make a good prognosis of what was going to happen to the great State of Georgia.

The last speaker mentioned that as soon as we recognize a psychotic condition in people they should be committed to the hospital. Where is there a hospital to commit them that is appropriate? There are very few and these are altogether inadequate. The other day I looked at a beautiful edifice ready for worship which cost half a million dollars and said to one of the enthusiastic builders: "What a pity that it is not an asylum!" If we had that edifice in Chattanooga for the care of people afflicted with mental diseases, how much good we could do for the people of the Nation.

It requires a peculiar man to study neuropsychiatry. He must be divorced from commercialism and must be a living sacrifice to neuropsychology, with no desires outside of that, looking for no reward but the reward and the satisfaction that scientific achievement gives.

Dr. Echols (closing).—I wish to emphasize one point. The mental disease problem is a medical problem and must not be divorced from the medical profession. We must have the help of different organizations, the social service worker, the clergy, clubs, newspaper men, and so on. We need their influence. It is a medical problem and can be solved only in one way. Dr. Campbell, in a letter to me recently, summed up the situation when he said that there should be a general diffusion of psychiatric knowledge among the medical profession in general, so that patients may receive treatment months or years before they receive it at present.

FOOD AND LIFE*

By C. Hilton Rice, Jr., M.D.,
Montgomery, Ala.

During the past decade no set of workers in any department of dietetics has had anything like the opportunities of the pediatricians for observing the effect of food on life. For our experiments have been made not on laboratory animals or special nutritional cases, but directly and entirely on the human young. To hundreds of thousands of children we have fed an amazing variety of food formulae and have kept detailed records of results. In the name of science we have committed some ludicrous absurdities, but somehow we have muddled through to the rational basis of present day simplified infant feeding. We have learned that mathematical talent is not necessary to success in infant feeding; that precise caloric estimation is not fundamentally essential to child welfare; that the human infant is not a test tube, but a finely adjusted, protoplasmic organism capable of indicating in a number of ways his caloric requirements.

We have learned that a new special nomenclature solves no nutritional problems; that lactic acid milk and fat-free milk are still the plain old-fashioned buttermilk and skimmed milk. We have learned that the pediatrician and not Nature first advocated the split protein and the pediatrician failed. We have learned that babies weighed in grams gain no faster than those weighed in pounds and ounces. We are ready to admit, some of us reluctantly, that modified whole milk is better than modified top milk, that cooked milk gives better results than raw milk, and that plain old breast milk still heads the list of infant foods.

In short, we have come to see that the food and life problem cannot yet be reduced to a mathematical formula. With due regard for the chemists and the immense help they have given us, we know, from long observation, that he who thinks

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of food in terms of fats, proteins, carbohydrates, vitamins, calories, etc., gets a false perspective unless he also sees, beyond and behind, the great background of Nature against which he sets up his classification. For man is an integral part of the system of life about him. His flesh is of the very substance of his environment, air, water and soil. In him and through him play the forces of Nature. Directly and indirectly he is connected in a thousand subtle ways with his surroundings. In the soil beneath his feet bacteria and the roots of plants are laboring in symbiotic relationship in the first steps of his food preparation. The plant root feeds the bacteria and the bacteria in turn extract the nitrogen from the air and feed it to the plant. This nitrogen, along with water and other life elements in solution, passes into the plant to be utilized by the cells in their mysterious synthesis of food substances. In the green leaf of the plant another miracle of chemistry is wrought. Out of sunshine, water and carbon dioxid, and in a manner that defies laboratory imitation, the carbohydrates are compounded.

To insure the perpetuity of the plant in its life-giving function, countless species of beings lend their aid. Worms bore into the soil, opening up channels for the circulation of air and water, and myriad other creatures are eternally busy in reducing dead organic matter to its elemental state for re-utilization as plant food. Everywhere over the earth pollen-carrying insects are winging their busy ways from flower to flower that plants may reproduce their kind and guarantee to man and the animal world their varied and abundant diets.

Perhaps the outstanding concept of modern biology is the essential unity of life. More and more clearly the biologists and the physiological chemists are coming to see the bonds that link together all organic beings into a great cooperative system. More and more it becomes apparent that the protoplasmic machinery of this system is maintained in operation by the energy derived from the sun. There is yet a vast deal of mystery about the nature of life itself, but so far as our mortal activities go we literally are "children of the sun." It is the stored solar energy of the plant that keeps the animal world in motion, for all animals feed on plants or on other animals that feed on plants. The act of eating is merely our means of connecting our protoplasmic batteries to the solar charging station via the plant.

That is why it matters a vast deal what we eat and the form in which the various foodstuffs come to us. That is why the wild creature possesses a vigor and stamina and resistance to disease unknown to the domestic animal. All of his points of contact with Nature are established and he fairly glows and crackles with the energy of life. That also is why we see the blight of malnutrition on so many children. Too many points of contact with Nature are blocked. Shut in from the sun they become pale and rachitic; feeding on a deficient diet, solar energy reaches them in feeble and broken currents and they become listless, irritable and easily fatigued.

Since the chief purpose of nutrition is to supply solar energy to the organism, it would seem to follow that the fresher the food the heavier the charge of energy it carries. For example, there should be more of a vital kick in a fresh baked potato than in an equal quantity of a bleached, dessicated cereal that is kept for weeks or months in a container and then submitted to prolonged cooking. Certainly, as expressed, not in terms of caloric values, but in its effect on the child, the cereal appears to have lost something which the potato retains. Two years ago I began substituting potatoes for the cereals in my diet list for children from the twelfth to the fifteenth months, and the experiment has convinced me that a milk and potato diet will put more "pep" into a child than the milk and cereal diet.

In short, I have become an ardent advocate of the fresh food diet, of foods not only rich in vitamins and essential mineral content, but which carry their maximum charge of solar energy.

There is a philosophic saying that one cannot abstract the trout from the stream. This also is true of the human being. Strive as we will we cannot, by abstract thought, separate or isolate the individual

man from his environment. Evolution has done a vast deal for man, but she has not set him apart as an independent entity. He still is bound by indissoluble bonds to the organic kingdom within the womb of which he evolved into being. Figuratively speaking, urgent nutritive needs still turn his hungry, groping lips to the protoplasmic breasts of Nature, whose lacteal ducts originate in the roots and leaves of the plant and ramify through the ascending scale of organic beings to reach the nursling.

So it is that man receives his daily fill of synthetized terrestrial matter for body building; and so he receives his voltage of solar energy which he transforms and releases in his various activities.

To special research workers in the field of dietetics this point of view may seem more philosophical than scientific, more theoretical than practical, yet to us, whose daily work is the feeding of children, it is highly essential that we get the broadest possible vision of the food and life problem, a comprehension of the larger aspects of which is more important to us than the more technical knowledge of food analyses and syntheses. The very urgency of our task compels us to run far ahead of the food chemists. We have attained our present day success in infant feeding not by rational scientific methods, but by the age-old "trial and error" method. We use our various food formulae because they give results. We shift from combination to combination without a clear understanding of why a particular formula should succeed and others fail. We have a dozen feeding cases on as many different formulae. We encounter a difficult case that rejects what is indicated and thrives famously on some freak formula that violates all the rules of dietetics. In clinics and section meetings we preach scientific methods; in private practice we resort to empiricism, and it is in private practice that we get our best results.

That this is so does not lessen the value of the service we have rendered humanity. That we have learned to feed the infant deprived of breast milk is the chief triumph of pediatrics and the outstanding achievement in the history of dietetics.

We turn now to face the greater problem, the feeding of the child from his second year to adolescence. And the problem is not what a child should eat, but how to get him to eat it. To train children to eat properly so that they will maintain good habits of diet through life is the chief problem of preventive medicine and apparently the most hopeless.

In 1920 (*Journal A. M. A.*, July 10) I called attention to the probable relation of acquired food dislikes of childhood to the metabolic disorders of middle life. I pointed out that many children pass on into maturity with positive dislikes for certain essential foods, and that many "chronics" who haunt the office of the internist confess to food dislikes that date back to childhood. Further observation has convinced me that much of the ill health of later life is traceable to poor dietary habits formed in childhood.

We all know the difficulties encountered in holding an older child to his diet. Against the little influence that we wield a hundred stronger influences are opposed. Fresh roasted peanuts, bottle drinks, hot dogs and lollypops—that is the diet of young America. And when children pale and sicken and lag in the mad rush of life their parents bring them to us so that we may develop them back to the point where they can eat anything at any time "like other kids." From the viewpoint of nutrition the majority of the flappers and the jelly beans show all the signs of hectic weaklings sucking on the hind teats of Nature.

Visualized against the broad background of our complex, modern civilization, a solution of the food and life problem appears at once as the most vexing and discouraging and the most interesting undertaking of organized science. Already the great work is under way. Everywhere research workers, internists and pediatricians are making experiments and observations on human and animal nutrition.

However, the greater task is ours, for to us is left the feeding of children as they come to us one after one. By what means we shall exercise control over their diets from birth to adolescence is the topic open

for discussion. In my own limited sphere I have obtained gratifying results in certain instances by telling to intelligent mothers the story of food and life, somewhat as I have tried to tell it here. Of late, several mothers have informed me that their entire families were following my diet instructions and all were showing surprising improvement in physical appearances and dispositions.

DISCUSSION

Dr. L. T. Royster, Norfolk, Va.—Until we know the chemistry of the food that the child digests and at least the fundamentals of the principles of metabolism, we cannot adjust the food to the needs of the growing child. Now, this resolves itself into one very important thing, a balanced ration.

I want also to say that we must form an intimate partnership with the knowledge possessed by a first-class cook, and it is here we fail. What success I have attained in nutritional cases comes from my having taken a practical course in cooking. That brings up two points I want to stress. In the cooking of green vegetables upon whose importance such stress has been laid, boiling takes out about 80 per cent of the vitamins, leaving in only 20 per cent of them. Steaming reverses the percentage. There is no better way for the growing child to receive carbohydrate food than by the potato, but not boiled. That potato should be baked in a slow oven very thoroughly. We hear much about the deficiency diseases. Preceding the definite syndrome that we are pleased to call by this, that and the other name, there is a period of malnutrition with a picture and symptom-complex depending largely on which food factor has been most efficient.

Dr. W. L. Funkhouser, Atlanta, Ga.—Some four years ago Emerson, of Boston, came to Atlanta to study the nutrition of the school child and to teach nutrition. He found the greatest percentage of malnutrition in the school of the so-called better classes and in the negro schools; the lowest percentage was found in an orphan home where the children had a carefully balanced ration. In the schools which you might call just above middle class there was also a very small percentage of malnutrition due to the fact that the parents were intelligent, did their own work, the food was well cooked and the children had well-balanced food. The remedy is in properly cooked food and a properly selected variety of food. It is our duty to teach the mother how to prepare this food.

We cannot think of defective nutrition without considering the child who refuses to eat. This is quite a serious problem, one calling for careful physical examination, and often thorough psychological study. Also, we should study his daily regime to see he is not overworked and that he gets sufficient rest.

Dr. J. H. Graves, Houston, Tex.—Three-fourths of the world's children never see a physician. The average child who has malnutrition has it brought on by the modern complexities of life. The women will not devote the time that is necessary to preparing food, to cooking cabbage, beans and other foods that are necessary for the subsistence and strength of the growing child. The children get the outdoor exercise they need, the majority at least, except the very poor, who live in tenements and crowded insanitary places, but I believe it finally comes back to the housewife and her responsibilities. The people will have to be re-educated along the lines of nutrition just as the physician will have to be. It is the complexities of modern life that are producing so much maltnutrition.

Dr. Rice (closing).—I have learned as much from watching the so-called normal child as from feeding a case of malnutrition. The majority of children get along famously without the care of a pediatrist. The reason these children do well is that they eat everything and by eating everything they get all the food elements they need. Parents want their children to be like other children. In pediatrics, because it is a new specialty, we have overdone some things. Handing out diet lists does not solve the food and life problem. There are a thousand and one other factors that come in. In a family that knows how to live you may find two children that never have had trouble and a third child that suffers from malnutrition. They know what this child ought to eat, but they cannot train him to eat it. A mother came to me recently who had a well-trained children's nurse with her. She had taken her child to numerous pediatricians throughout the country and finally she came back to Montgomery, with the statement that she simply could not get the child to eat. I told her the child was suffering from too many pediatricians and diet lists. I advised her to get rid of the nurse and to let the child go out in the kitchen and eat with the cook. In a week's time the child was eating everything.

TRANSFUSION THROUGH THE UMBILICAL VEIN: CASE REPORT*

By J. Buren Sidbury, A.M., M.D.,
Wilmington, N. C.

History.—R. L. F., a male, was admitted to the hospital March 7, 1919, when two days old because of continuous bleeding from a dorsal slit incision of the penis made just after delivery. Labor was normal, birth weight 9 pounds, and he was the fourth pregnancy. There was no cyanosis, no jaundice, and no history of any hemorrhagic disease in the family. Three other

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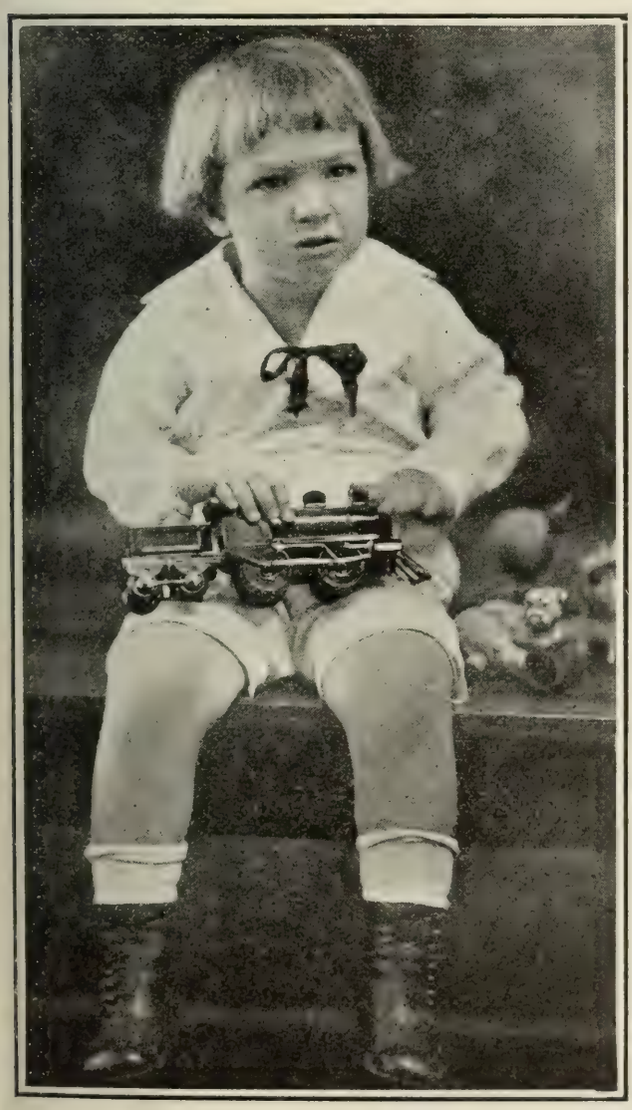
children were living and well, and the father and mother were living and well.

Physical Examination.—He was a well-nourished infant, rather pale and with a somewhat wrinkled skin. He weighed 8¼ pounds, was rather listless and had a somewhat feeble cry for a baby as large as he was. Heart, lungs, abdomen and extremities were normal. The penis was surrounded by a rather thick dressing of gauze, which showed considerable bright red blood. The penis incision had been stitched over with the effect of having a new bleeding point from each needle puncture. A number of so-called local astringents had been applied, also calcium by mouth and one or two injections of "coagulins" had been given, but the bleeding continued. At this time the baby was given 15 c. c. of whole blood subcutaneously from the father, and this was repeated in eight hours. The nurse reported at the time of the second injection that the bleeding had been less since the first injection, but it had not ceased entirely. Eight hours later the third injection was given, and no bleeding had been noticed after the second injection, only a very slight oozing of serum.

At this time, the third day of life, the baby's blood showed the following: hgb., 25 per cent; red blood cells, 2,000,000; coagulation time, 15 m. The baby had taken no food except sugar solution 5 per cent, and was taking very little water, so naturally was very weak. It was decided to give the baby a transfusion and the mother was brought to the hospital from her home in the country, twelve miles away.



The following day, March 9, the baby was given 100 c. c. of blood through the umbilical vein by the Lindermann method. The baby had a slight chill and a rise of temperature to 103°, which came down to normal immediately and made an uneventful recovery. His hgb. was 80 per cent and red blood cells were 4,500,000 after the transfusion. At twelve months this baby weighed 25 pounds, at two years he weighed 30 pounds, and at three and a half years he weighed 38 pounds. He is normal in every way, as his photograph indicates.

This baby was transfused through his umbilical vein on his fourth day of life with the greatest ease. The fact that the majority of the hemorrhagic disease of the new born bleed in the first 48 hours of life should impress upon our minds the fact that if they have to be transfused they may be transfused through the umbilical vein with greater ease than any other way. The blood of these babies has a prolonged clotting time and bleeding time, and for that reason the probability of a clot's forming in the collapsed umbilical vein is very unlikely. I have performed necropsies in two cases of hemorrhagic disease of the new-born and the dissection of the umbilical vein to its entrance in the liver was smooth throughout and no signs of clots were seen. It has been found by Rodda and Warwick that blood in these babies has been found in the fluid state for hours after death.

To familiarize us with the anatomy of the fetal circulation, I am quoting from Gray's "Anatomy," which will emphasize its simplicity:

"The umbilical vein enters the abdomen at the umbilicus and passes upward along the free margin of the suspensory ligament of the liver to the under surface of that organ, where it gives off two or three branches to the left lobe, one of which is of large size, and others to the quadrate and Spigelian lobes. At the transverse fissure it divides into two; of these, the larger is joined by the portal vein and enters the right lobe; the smaller branch continues outward, under the name of the ductus venosus, and joins the left hepatic vein at the point of junction of that vessel with the inferior vena cava. The blood, therefore, which transverses the umbilical vein reaches the inferior vena cava in three different ways. The greater quantity circulates through

the liver with the portal venous blood before entering the inferior vena cava by the hepatic veins, some enters the liver directly and is also returned to the inferior vena cava by the hepatic veins; the smaller quantity passes directly into the inferior vena cava by the junction of the ductus venosus with the left hepatic vein."

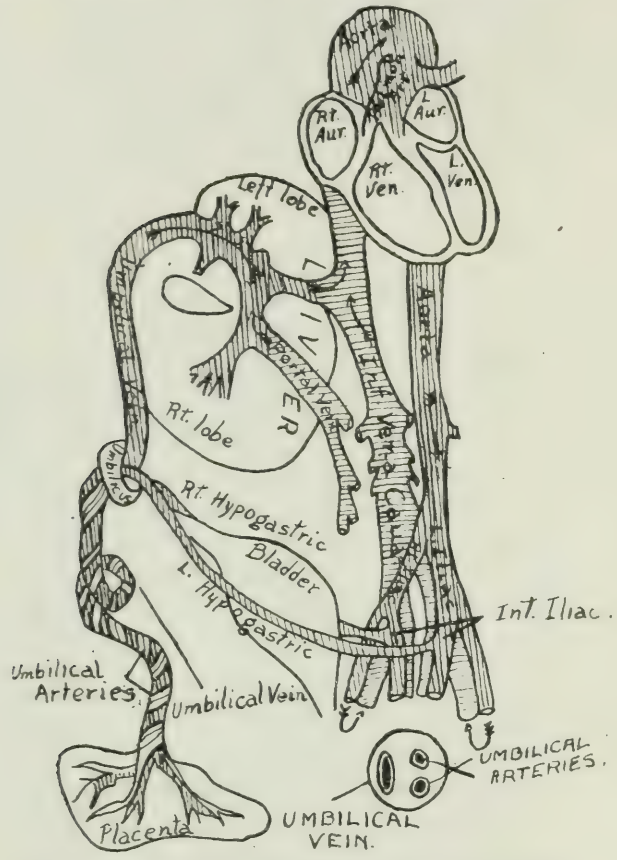


Diagram of Fetal Circulation, Gray's Anatomy.

CONCLUSIONS

(1) The umbilical vein may be patent and accessible for use for transfusion up to and including the fourth day.

(2) The superior longitudinal sinus is a comparatively easy route for one experienced in such methods, but not so to one not experienced, while the umbilical vein is simple for any one doing transfusion.

DISCUSSION

Dr. W. L. Funkhouser, Atlanta, Ga.—Cases of hemorrhage of the new born are very interesting because of the opportunity to get good results when treatment is not delayed. Not only in active hemorrhages but in cases of convulsions and high temperatures that come on immediately after delivery due to hemorrhage, early diagnosis and treatment is important. These cases should be tested out for the coagulation time and the bleeding time. If subcutaneous injection of blood does not give results, intravenous injection of blood will frequently result in prompt improvement. Dr. Sidbury's method is interesting, giving a new avenue for transfusion.

Dr. W. McKim Marriott, St. Louis, Mo.—Dr. Sidbury has given us a valuable method of treating hemorrhagic disease of the newly born. This condition is more frequent than has been generally recognized. Rodda, of Minneapolis, has been responsible for drawing attention to its frequency. These babies need blood transfusions, but it is often difficult to find an accessible vein. The superior longitudinal sinus is not a safe point for the injection when there is a tendency to hemorrhage. Dr. Sidbury's method is practical and will probably become the standard method of transfusing the newly born.

Dr. A. A. Walker, Birmingham, Ala.—When we realize that transfusion of whole blood acts as a specific in this disease 100 per cent of the cases ought to be saved. It acts almost like magic in stopping the hemorrhage and also furnishes blood to take the place of that lost. I had a very interesting case last year of this disease in which I did a transfusion of 50 c. c. of blood into the longitudinal sinus of a baby. Anyone who has had the experience of going into the longitudinal sinus knows that it is an operation with very few technical difficulties and with proper care it is easier than going into the veins of a fat adult. An analysis of 3000 autopsies on the new born made in New York showed that a large per cent of the deaths in children under one week was due to cerebral hemorrhage. Most of such cases, as Dr. Rodda reported, are true cases of hemorrhagic disease of the new born.

Dr. S. G. Glover, Greenville, S. C.—You see not occasionally but often in these young infants a type of convulsion and you wonder at the time what is its cause. One of the main causes is cerebral hemorrhage, and then again we have a condition known as infection through the cord. Not only that, but there are many infections through the cord or of the cord that are not recognized because the cord looks clean and you therefore are not suspicious of it. I was just wondering in this new method whether there might not be danger of infection through the cord regardless of how sterile you might be, as it is a common avenue of infection. At the same time would the possibility of transfusion through the jugular vein in preference to the umbilical vein be practical? I would like to have Dr. Sidbury express an opinion on that.

Dr. Oliver W. Hill, Knoxville, Tenn.—It is very difficult to get into the jugular vein of an infant, although it is perhaps the least difficult of the superficial veins.

Dr. Eugene Rosamond, Memphis, Tenn.—I would like to ask Dr. Sidbury if he typed this blood. I would like him to bring that out to complete his case report because it has recently been shown that the blood of the mother very frequently is coagulated by the serum of her infant. This method should not be used without typing the blood.

Dr. J. H. Mason Knox, Jr., Baltimore, Md.—The quantity of blood necessary in these cases is often over-estimated. Usually a very small quantity of blood, if given promptly, will stop

hemorrhage, which if allowed to go on a few days will require transfusion. As soon as the first symptom appears the diagnosis is possible, and some of the mother's blood can be given intramuscularly. A large group of these cases will need no further treatment.

Dr. Sidbury (closing).—Six or eight hours before transfusion was given, the cord was treated with sterile boric acid solution to keep it as soft as possible. It was then cut proximal to where it was tied and all septic precautions possible were taken. The blood was tested directly for agglutination and hemolysis, baby's blood against the mother's. We felt that this baby had lost three or four ounces of blood. It had been bleeding three days and was as white as a sheet. The hemoglobin was higher than I expected because I think it was concentrated blood. The baby lost a good deal of serum as well as fluid. My object was to replace the lost blood. The other method of giving the blood would be through the superior longitudinal sinus, or to have cut down on the jugular or median basilic vein. With the mother in the room I did not think this would have a good moral effect, so I gave the transfusion through the umbilical vein. I never heard of its being done before, but saw no reason why it could not be done.

EUROPEAN CHILD HEALTH PROGRAM AMERICAN RED CROSS 1921-22*

By J. H. Mason Knox, Jr., M.D.,
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The services of the American Red Cross in Europe during and subsequent to the Great War can be divided into several phases. Before America entered the war, a large amount of supplies were forwarded to nearly all the belligerent countries. Immediately upon the entrance of our Country actively into the war, the activities of the American Red Cross were increased many fold.

Primarily, of course, the duty of this organization was to care for the comfort of our own fighting forces and to supplement in every manner possible the medical and nursing services of the Army and Navy. At the same time, the American Red Cross took an active part, through its Department of Civil Affairs, in Europe in carrying on important work for the civilians of France and Belgium. The more important of these activities were concerned with giving assistance to the refugee populations driven out of northern France and Belgium and to the organization of various health activities for the children of these countries.

In this connection a number of important activities were started which have continued since and are proving real contributions to the child health program in France. Among these may be mentioned the School of Periculture in Paris and the demonstrative work for children in the Fourteenth and Nineteenth Arondissements in Paris.

Following the Armistice, the American Red Cross increased its activities to a general relief program, extending gradually to most of the countries of Central Europe. It cooperated actively in the plans of the American Relief Association, which conducted a remarkable system of feeding kitchens, particularly for the children of the devastated and impoverished European countries. The amount of material of all kinds distributed through the American Red Cross will always remain a monument to the generosity and good will of the American people. It is doubtful whether there are institutions for children in the whole stretch of country from the Gulf of Finland to the Adriatic which have not received supplies, particularly medical supplies and equipment from the American Red Cross.

In the Spring of 1921, the question of withdrawal from Europe was considered by the authorities in Washington. The acute suffering among the children of Central Europe was considerably relieved. There were practically no cases of real starvation, but there was widespread malnutrition and many conditions untoward to the development of normal child life. It was, therefore, determined to devote a final year in an attempt to assist these new-formed democracies of Central Europe to alleviate the condition of the children and to help the people of these

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countries in starting or continuing health activities for the children which would be permanent in character and carried on by the people themselves after the withdrawal of the American personnel.

This seemed to me to be an alluring opportunity. The future of these newformed democracies, of course, depends upon the physical, mental and moral status of the children, their future citizens, and to have anything to do with a program intended to better permanently the health of these child populations was a great privilege.

My first trip as Field Medical Director was to the three Baltic states, now independent democracies, Esthonia, Latvia, and Lithuania. Our Commission there, under the direction of Colonel Edward W. Ryan, had already contributed greatly to improving health conditions of these countries. It had helped to stamp out a threatening typhus epidemic and had administered to the wounded of all belligerents in the recent local campaigns, for it must be remembered that the war did not cease in this territory after the Treaty of Versailles.

The services to the children of these countries naturally began in cooperation with the American Relief Association. A large group of small clinics under the direction of local doctors and nurses, and with the supervision of American personnel, was started in connection with the feeding kitchens. Usually a room in the same building or one near by was selected, and as the line of children formed to obtain their one standard meal in twenty-four hours, those that seemed sick or malnutritic were selected and given medical attention at the clinics.

One hundred and fifty of these ambulatoria were established. Most of them, of course, were temporary in character, and our endeavor later was to close those which were unnecessary and coordinate the activities of the remainder with the cooperation of the few existing hospitals and clinics in the three countries.

Perhaps the most important contribution to the child health program in these countries was the selection of a small number of strategic areas where, with the assistance of the local authorities, special places were selected wherein a fairly complete child health program, beginning with prenatal care, good obstetrical service, early postnatal care from the baby's birth and extending into and often through the school period, was undertaken.

We selected, where possible, university communities and worked with the active assistance of obstetrical and pediatric clinics. This business of trying to keep well children well through home visits and instruction to mothers was somewhat new, but the physicians and public officials became enthusiastic in their interest.

These centers were started at Narva, Reval and the wonderful university town of Dorpot in Esthonia; in Libau and Riga in Latvia, and in Korno in Lithuania. Recent reports received from these countries indicate that the work for children thus started has been continued and increased considerably since our withdrawal last July, and we have every assurance that it has become a permanent asset to the children in these countries.

We believe that when medical students by personal experience learn how much easier it is to keep well children well than to cure sick children, when they begin their medical practice in the rural districts of the Baltic states they will be interested in starting similar activities in their own communities.

In Poland work of a similar character was undertaken. The program of the American Relief Association in Poland was organized with particular efficiency by the Poles themselves through the so-called P.A.K.P.D., the Polish-American Committee for relief of children. This organization had established feeding centers in all sections of the country, in the cities and larger towns. To further the work of the American Red Cross, a subcommittee on health was organized in connection with each of the local P.A.K.P.D. committees. These health committees were composed of the health officers and physicians in the district, and were instrumental in establishing clinics for the care of mothers and children.

In addition, in Poland, demonstration areas were selected also in Wilno, Warsaw, Krakow and Lwon (Lemberg), all in connection with pediatric clinics, where an effort was made to reach all mothers and young children. In each of these centers classes were organized. In some of them milk, a scarce article of diet in Poland at this time, was distributed under the doctor's orders.

With the assistance of the League of Red Cross Societies, an interesting campaign of propaganda was carried on in Poland. A corps of lecturers was secured to deliver carefully prepared discourses on maternity and child health work, suitable not only to adults but to children. A number of moving picture films on various phases of child health activity were shown. The Polish Government placed a railroad car at our disposal. An advance agent went ahead engaging halls, visiting the officials and prominent citizens, distributing posters, etc., and then the car would arrive and a stay of from two to three days or perhaps a week, depending upon the size of the town, was made in most of the large cities of the country. The greatest interest was elicited, and practically every hall engaged was crowded for each of the lectures.

Follow-up work for children was organized by nurses and doctors after the lecturers had left. It is estimated that more than four hundred thousand children were reached through the clinics started in Poland.

One of the great difficulties encountered in Poland was to secure the right kind of physicians for our stations. In all of the country there is only one physician to about every ten thousand inhabitants, and many of these doctors are still required for military service. There was also a shortage of nurses, and indeed the trained nurse, as we know her in America, is almost unknown in Poland. This profession has not attracted as yet young women of education and culture.

To make good this deficiency, a short course for nurses' aids was organized in Krakow under American nurses, and through it approximately one hundred young women were prepared for service in the various clinics. Under supervision, they have done remarkably well.

A project of even more importance for the public health of Poland in the future has been the establishment of two training centers of high standard for nurses, one in Posen and one in Warsaw. To these schools Polish girls of education and refinement have been attracted and are now going through a course that is quite equal to those in our best schools in America. Both of these schools are under the supervision of splendid American nurses, associated on their faculties with Polish nurses trained in America. The graduates of these schools unquestionably in due course will greatly promote the profession of nursing in Poland.

Czecho-Slovakia has been described as a war baby born after a long period of waiting through the instrumentality of Dr. Masaryk and President Wilson. The program in Czecho-Slovakia was carefully considered before the American Red Cross began operations. It was finally agreed to establish twenty-one completely equipped health centers in that country. The installation of these centers progressed slowly, and the last one was opened in November, 1921.

A careful survey of each community in which the centers were established was made, and the Government, through its Ministries of Health and Social Welfare, rendered valuable assistance. A central advisory board was established upon which Government ministers, university professors, both Czech and German, medical societies, child health organizations, and the Czecho-Slovak Red Cross were represented.

The first contact through these centers was made with school children. It was found that a large proportion of them were remarkably malnutritic. Through the help of these health centers, thousands of school children for the first time were brought under medical supervision.

One of the great difficulties in Czecho-Slovakia was the widespread racial antagonism. In many instances this was overcome, and all the elements in each community were persuaded to work together for the general good.

There was also in Czecho-Slovakia a dearth of diplomatized nurses. To meet this need, a school of nursing was opened in Prague in connection with the City Hospital. Two wards of the Hospital were taken over by the American Red Cross, and the thoroughness of the work done there and the skill with which the patients were cared for in these wards has made a profound impression upon the attending physicians. It is interesting to relate that during a serious illness President Masaryk asked for and was nursed by American nurses.

One of the important developments of the work, particularly in Czecho-Slovakia, was the training of health visitors for work in the clinics. Women of considerable education were selected and given practical training at the centers and a didactic course in both languages at Prague. The work is now being efficiently carried on by native doctors and nurses under a young Czech physician who spent a year studying child health activities in America.

Austria, perhaps more than any other country, has suffered in its resources from the World War. Although there were many physicians and others familiar with child health work, the lack of resources prevented much that they would like to do. The problem of the American Red Cross was primarily that of assisting existing organizations and of securing cooperation in a general program for mothers and children.

The lack of sufficient public health nurses was also felt in Austria. Indeed, the salaries at the present rate of exchange are so small that nurses can only live when they do institutional work. However, a number of short courses for health visitors have been started and the nursing superintendents of child health organizations were induced to cooperate actively in our program and supervise the work in the stations.

An interesting experiment in modern alchemy furthered our work. We were able to change a large amount of tobacco in the possession of the American Red Cross after the war, with the approval of the Austrian Government, into milk; that is, into the purchase of dairy cows, which contributed materially to the services of the various stations.

In each of the provinces of Austria committees were formed for the carrying on of the children's work and a strong central committee had been set up in Vienna, which will have general direction of these activities in the whole country.

Hungary was the last country entered last year by the American Red Cross, and because of the cordial cooperation of the St. Stephena Society, which had been doing excellent work for children throughout Hungary for several years, a really remarkably satisfactory program was made possible.

With the assistance of local committees, more than sixty stations for mothers and children were started in the various larger towns in Hungary. Some twenty-five of these were in Budapest. In fact, the whole city of Budapest is covered by a series of areas in which there is a well-equipped health center presided over by an obstetrician and pediatrician with the assistance of several nurses. In each of these centers there are prenatal clinics, clinics for mothers and young children and clinics for the preschool child.

Practically every new-born child is promptly visited, and in some of the stations 75 per cent of the pregnancies are registered some months in advance of the confinement. So-called wander boxes, containing the necessary supplies for maternity work and baby care, have been prepared in large numbers and distributed throughout the country to be loaned to indigent families.

It is interesting to know that by Government regulation every cinema performance in the country must include several minutes of films depicting some phase of child health work.

It is to be greatly hoped that for the furtherance of child health work in general throughout the world, the program now carried on in Hungary may suffer no interruption.

It is only fair to state that much of the efficiency of this exceedingly interesting program was due to a young Hungarian physician, Dr. Paul Zentai, and that he received much advice and assistance from

Dr. Philip C. Jeans, of Washington University, St. Louis, Mo., Associate Field Medical Director, and had the cordial support of our Red Cross Commissioner to Hungary, Captain Pedlow, who endeared himself in a unique manner to all classes of the country.

The child health work in Jugo-Slavia was directed primarily by the Serbian Child Welfare Association of America, which received a liberal subsidy from the American Red Cross. The American Red Cross also furnished some personnel and was called upon frequently for advice. The Director of this Commission was Dr. R. R. Reeder, well known in this country and a veteran in American Red Cross service.

The outstanding feature of the work in Jugo-Slavia was the very successful educational propaganda in the schools and the preparation of text books on health. The carrying organization in this country was the so-called Health Cooperative, an organization which has been very helpful in promoting farming in all parts of the country.

Through this organization ten health centers were set up, which covered ten different areas. In Belgrade, under the supervision of an English nurse, with the assistance of the American Red Cross, a training school of high standard for nurses has been started.

Time will not permit me even to outline the American Red Cross service to other countries of Central Europe. Important relief programs, having also some constructive and permanent features, were started in Albania and Montenegro. An exceedingly interesting health center was opened in Athens through the enthusiasm and influence of Mrs. Charles M. Heilman, an American nurse. This clinic has survived several changes in government, and has the support of both the Government and leading citizens of the State. Similar work and courses for nurses was also started in Constantinople.

As one looks back upon a year's experience in Central Europe, several outstanding facts loom in the horizon: first, the general feeling of patriotism in these newformed countries, native races indigenous to the soil are coming into their own now for the first time in several countries after years of oppression.

Secondly, there is the great desire for education. Students, men and women, are crowding into universities in these countries in larger numbers than ever, all anxious to equip themselves for life and service. Certainly it is not to be that this energy and devotion will come to naught. The strong countries of the world must see to it that the latent energies springing up in the newly-formed democracies are not thwarted, but are protected and given the opportunity under favorable conditions for self-expression.

Sir Arthur Newsholme, who attended by invitation the Medical Conference of the Red Cross Commissioners in Paris, spoke enthusiastically about the results of the child health program. He said that new ideals had been given to hundreds of physicians in various fields, and that even if a single child's life had not been saved through American endeavor, great good had been achieved in these demonstrations. They had shown that the boundaries of nationalism can be broken down, and that men and women of one country can sympathize and help men, women and children of another.

DISCUSSION

Dr. W. A. Mulherin, Augusta, Ga.—We ought to be proud of Dr. Knox's activities in Europe, and likewise proud that he is a member of this Section. It is very pleasing and gratifying to have Dr. Knox give us first-hand information, since his return from Europe, about his activities with the American Relief Association. Likewise it is very instructive to learn of the excellent organizations which were perfected under Dr. Knox's command. Such organization appears to me to be ideal, and it is not difficult to understand why such good results were secured.

Dr. W. L. Mitchell, St. Louis, Mo.—Dr. Knox has just told you that the work in Poland was combined with the work of the American League Administration, or the Hoover people. This combination took place in the winter of 1920-21 and the work began in the spring of 1921. The Hoover people were doing entirely feeding, while the Red Cross people were doing entirely relief work, except for the medical work that was being done in these little places. The combining of these two organizations grafted onto the work of the child health program that was in its infancy led to some very good results. At the

time of combining the two organizations the American Red Cross was feeding 1,200,000 people daily in Poland. Of this number those between three and sixteen years were receiving 3 grams of various kinds of food, all cooked. The children between 0 and 36 months received 120 grams consisting of a milk preparation. When the American Relief Administration began its work in Austria in 1918-19, the influence of Pirquet was brought to bear on the American Administration to such a great extent that they had to permit Pirquet and his followers to examine all children before one ounce of food was given. The result was that each child received the proper kind of food and the proper amount. Pirquet developed his system of measuring food. In Poland that was not possible because of the economic and militaristic conditions in the latter part of 1918 and early part of 1919. Then, too, there was no von Pirquet in Poland.

At the time we began our child health program the children had been fed for two and one-half years without a medical examination. The second year I made an examination of 2500 children between the ages of 0 and 36 months, averaging 13 months. Sixty-five per cent were diseased; 10 per cent of all examined had rickets; and 25 per cent of all examined had malnutrition. The high incidence of rickets and malnutrition was entirely due to faulty feeding. The high incidence of disease is due to the fact that medical examinations were not made. When the American Red Cross joined hands with the American League Administration they established infant health stations, 68 of them, throughout Poland, where the children who were being fed by the American Relief Administration were examined by competent physicians and given medical advice. Public health workers were brought into the game and home visiting was established. Mothers were advised as to clothing for the children. Besides that food was given to them. Unfortunately there was not sufficient fresh milk in Poland to supply children up to even 2 years of age, so we had to make use of phosphated milk. We got plenty from America. From this we made up food and gave it out in bottles. Then, too, the mothers were advised to add fruit and vegetable juices to the child's diet until the winter of 1921-22, when oranges were forbidden in Poland because they were considered a luxury. That was due to the economic standpoint. Last year they were permitted to come in from Italy, but they were too expensive for those who demanded this sort of feeding to purchase. Enormous quantities of cod liver oil were given out. This was given to every case of rickets and malnutrition and was possible because the American people sent it over through the American Red Cross.

Dr. R. R. McHenry, Seligman, Mo.—I served two years over there in the Russian Commission under Col. Ryan. Our work was relief work until Dr. Knox came and the child health program was established. Almost all my work was done in Serbia with the formation of a child health program. We went to Serbia and tried to help them help themselves. You may not know that while Serbia has the highest birth rate it also has the highest death rate. We were out in the country and were up against the real thing in trying to feed these children and to give prenatal and postnatal instruction to the mothers. I went there and devoted three months to the work of eliminating intestinal worms, a complaint with which every one suffered. Some of these people passed from 4 to 200 worms, many of them a foot long. You cannot conceive of the seriousness of the affair. I tried to teach the mothers that these intestinal worms were not something necessary to the growth of the child, but a disease that should be treated. I believe we accomplished much with our work.

Dr. Frank Howard Richardson, Black Mountain, N. C.—It is quite a new thing to think we have been teaching Europe after learning from them for all these years. I hope Dr. Knox will put his experiences in his State on paper, so that some of us can make use of them in our own states.

Dr. Philip F. Barbour, Louisville, Ky.—There are many states in our own beautiful country that need health campaigns as much as Europe. Our Southern pediatricians will have to do health work to develop among the people an idea of the necessity of doing intensive work among children. Some of our states are doing splendidly, but they are not reaching everybody they ought to reach. The smaller districts away from the railroad are not getting much benefit, and we should ourselves try to bring home to those in the smaller communities the necessity and the value of health campaigns for children.

Dr. John Barbee, Knoxville, Tenn.—Already in my community we have put on two full-time nurses for community work. I think we are handicapped in not knowing how to approach the doctors in the State. In our communities when a problem comes to us we put on our work to the extent of pauperizing our community. We have been taking away from the profession in general because no few men can do what a great profession can do. If the profession can educate along the lines Dr. Knox educated the people in Europe we could do more for the community than if a few individuals were doing the work.

I am interested in the question of whether the work should be continued in foreign fields when there is so much to do at home. This is a question that is being raised in the medical mind as well as in that of the laity. My wife is a director in the local Red Cross Association and just a few days ago she showed me a letter from Germany pleading for some American help to continue the day nursery, that in the local community they were having to abandon it because of the great financial strain and by the first of January it would be closed up. In this day nursery they were caring for the babies so the mothers could go out and help make a living. Should we feel like withdrawing from foreign fields and giving to our own communities? We must consider that, after all, we are all brothers.

Dr. Knox (closing).—It is understood, of course, that the emergency program of general relief and medical assistance had been carried on before we arrived. There was a Red Cross commission in each of these countries doing relief work. Dr. Jeans, Dr. Manning and I as Field Directors were to give advice about the withdrawal of certain small clinics and the curtailing of the relief program as we were concerned with what was called a constructive health program in these areas.

I am glad that Dr. McHenry spoke of Serbia. I think the best school propaganda work was done there. It would be very interesting to see the three or four different groups of school booklets that were published by competitive examination for teaching child health.

Our experience in Europe taught us that the need of better health is universal and that perhaps the helpless infant is the most potent factor in leading the various races of the world to drop their past differences and to cooperate in a common effort to eliminate unnecessary sickness and death.

OBSTRUCTION OF THE BRONCHI BY NON-OPAQUE FOREIGN BODIES: CASE REPORT*

By C. C. Phillips, M.D.,
and
R. H. Lafferty, M.D.,
Charlotte, N. C.

Our reasons for presenting this paper are: first, to present an unusual case; and, second, to call the attention of clinicians to the x-ray as a valuable adjunct in diagnosing this condition.

Until Manges[1] and his colleagues published their epoch-making work, there was little known about the x-ray diagnosis of this condition. We had all seen the abnormal condition on screen and plate, but it was they who interpreted the signs so intelligently that the diagnosis in most cases is made easy.

The most frequent of the non-opaque foreign bodies is the peanut. The next most frequent, in our experience, is the watermelon seed, and we find that this does not cause obstructive signs in all cases, or at least there is not always evidence of obstruction at the time of examination. In others we have found obstruction on one side and in a very short time have found it on the opposite side, and even a third examination made within a few minutes will in some cases reveal no sign of obstruction, this being due to the ease with which the seed, with a hard, slick covering, moves from one part of the air passages to another. In none of the cases obstructed by watermelon seed have the signs been as definite as in those of some other objects, as the peanut, raisin, etc.

We are unable to add anything new that is of value to the signs from which a diagnosis is made, such as emphysema of the obstructed lung with consequent widening of the interspaces, depression of the diaphragm with limited excursions varying from a mild to a marked degree, in some cases even to a complete loss of movement and displacement of the mediastinal structures to the opposite side. The degree of these signs depends on the degree of distention of the lung. Almost always there is found some increase in density of the lung below the obstruction and sometimes abscess in this area. If the obstruction has persisted for a very great length of time, there is what is apparently congestion of the unobstructed lung. It seems logical that this may be due to overwork of the lung, or possibly to pressure of the mediastinal structures against it. If these signs are present we are sure there is obstruction of the bronchus. Manges[2] calls attention to extrinsic pressure as a cause of obstruction, this being caused in most instances by an hypertrophied lymph node, which casts a shadow on the plate. We would like to call attention to congenital atresia of the bronchus as a possible cause of obstruction.

The following case was mentioned by Peeler[3] from the standpoint of bronchoscopy:

Baby H., a girl, was referred by Dr. Y. W. Faison.

Weight at birth was 7½ pounds. It required forty minutes to resuscitate her. Otherwise she was normal. When two weeks of age her mother noticed dyspnea and cyanosis after crying. At the age of four weeks an x-ray examination was made and typical signs of obstruction of the left bronchus were noted (See Fig. 1). Despite the

*Read in Section on Radiology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

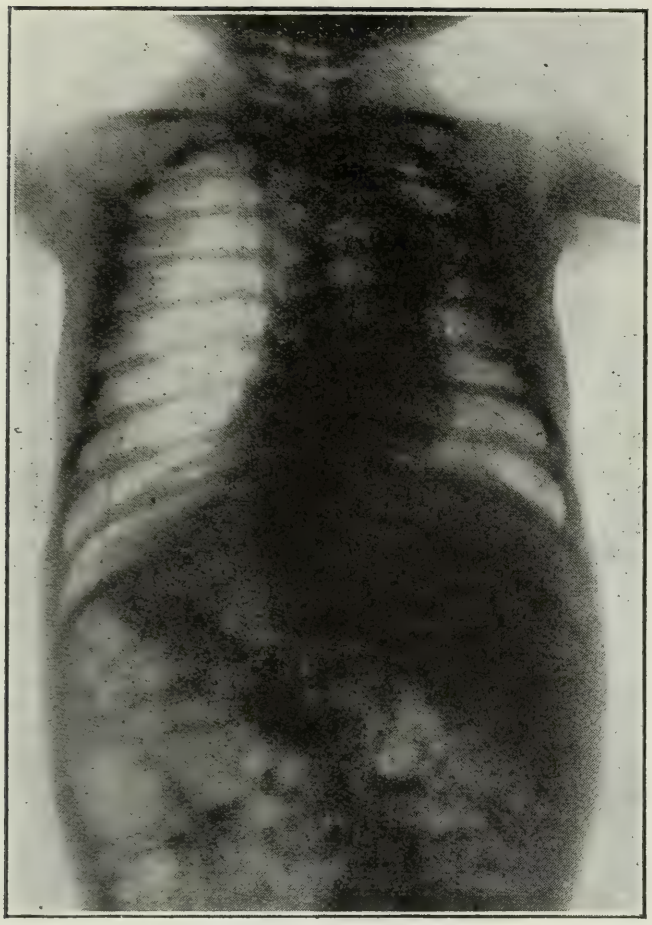

Fig. 1.

age of the child and lack of history of sudden choking, we assumed a diagnosis of foreign body. Bronchoscopy was attempted, but on account of the small size of the larynx, this was unsuccessful. The patient was examined at frequent intervals during the next four weeks of her life, and there was no appreciable change in the condition of the lung other than gradual increase in distention. Autopsy revealed that the left main bronchus was more than twice the size of the right with normal secondary bronchus to lower lobe, while those to the upper lobe showed atresia (See Fig. 2). The upper lobe was greatly distended, filling almost the entire chest cavity, and by firm pressure on this a small amount of air could be forced through the constricted bronchi, this leading to the conclusion that on inspiration a small amount of air entered the lung and the force of expiration was not sufficient to expel it. The lower lobe was found collapsed. Microscopic study revealed no pathology which could be attributed as a cause of the condition and led us to believe it was congenital.

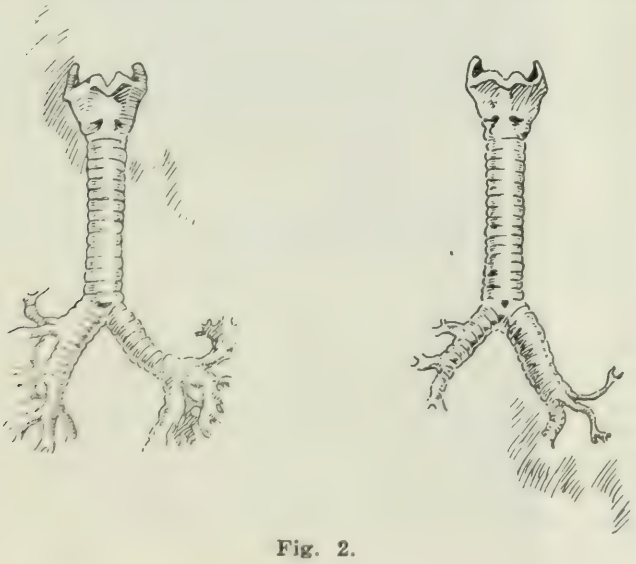

Fig. 2.

CONCLUSIONS

We feel that in the past many of these cases obstructed by foreign body have passed with the diagnosis of pneumonia and lung abscess and have gone to death or permanent invalidism before the cause was found. We would like to aid in a wider dissemination of knowledge among medical men that the condition is not a rare one, and that accurate diagnosis can be made and if recognized early a large per cent of them can be cured.

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DISCUSSION

Dr. A. L. Gray, Richmond, Va.—It takes more than ordinary diligence to determine definitely the presence of a non-opaque foreign body. I have missed them and have not discovered them until the lung or the lobe of the lung was beginning to show a water-logged condition. All of the difficulties that one meets with usually occur in very small children who always begin to squall when you attempt to make an examination. Dr. Manges does not think that is a very great hindrance, but with my limited experience and my rather tender heart I find that it bothers me considerably.

I may emphasize some of the points that have been brought out primarily by Dr. Iglauer, of Cincinnati, who was the first one to diagnose these conditions. Dr. Manges also has written a most complete dissertation on the subject. One will observe an emphysema which may not be plainly visible at all times, but which may be visible only at the end of expiration and of course can be determined only by comparison. A lag in the diaphragm on the affected side is considered of the greatest diagnostic aid. Now I want to emphasize a point. If you fail to find evidence of a foreign body at the first examination do not say there is no foreign body there, but try again. Perhaps you will find it the second time. The condition which appears to have been present in Dr. Phillips' case, namely, atelectasis, is indeed confusing. I recently had a case that seemed to be a congenital atelectasis from some cause in which both lungs were involved. This child was examined for the presence of a foreign

body. I did not find one. I made a diagnosis of delayed lung expansion. The child was three months old.

Dr. M. F. Arbuckle, St. Louis, Mo.—We cannot emphasize too much the importance of an x-ray study of these cases. As an adjunct to the diagnosis and to making out the location of these foreign bodies, it is most important.

The Doctor spoke of a child four weeks old in which the introduction of a bronchoscope was not successful. I wish to ask him if the 4 mm. tube was used. He also spoke of the many cases which go undiagnosed. That is very important. It is more important for the man in general practice or for the pediatrist to realize that fact than it is for the x-ray man, because once the x-ray man gets the case he will probably find the foreign body.

I have had a good many experiences in patients who had pneumonia from which they did not recover or pneumonia with recurrence, or some chest condition which had been diagnosed as pneumonia or tuberculosis or empyema which lasted for months. These patients wander from one doctor to another until finally they get into the hands of some one who has an x-ray examination made. In one case that I remember particularly well, a child who had had just such a course, the x-ray disclosed a six-penny nail in the bronchus which had been there for eight months. Bronchoscopy was advised. The child was at that time moribund. It was nearly pulseless and the parents were warned that there possibly would be a fatal ending. The trachea was filled with pus and when the bronchoscope was introduced the tube immediately filled with pus. The suction apparatus in the Jackson tube was put into use and we were succeeding fairly well in removing this pus from the trachea when the child suddenly stopped breathing. There was no other instrumentation whatever. I got a post mortem examination and found that the nail had come out of a nest of granulations in the bronchus and had then become impacted in the bronchus of the other lung, thus shutting off the remaining air supply. If that condition had been properly diagnosed when it was first present, or if an x-ray examination had been made, there is no question that the nail could have been removed at once and the child's life saved.

Dr. E. C. Samuel, New Orleans, La.—We have charge of the roentgen ray department of the Eye, Ear, Nose and Throat Hospital in New Orleans over which Dr. Lynch presides. I am sure that most of you know of his suspension work. There is hardly a week that we do not get a case or two of these foreign bodies. We have made it a practice in the last year or so in all instances possible to make a stereoscopic study of these chests and there has been considerable help derived from a study of the plates. It is not always possible, especially in children, to obtain both plates for stereoscopic study. I am sure that those of you who try it will find that it gives additional information which the single plate does not give.

Dr. N. C. Womack, Jackson, Miss.—I would like to say a word relative to the obstruction of bronchi by non-opaque bodies. In the diagnosis, the history is the most important aid; however, with the history an x-ray should always be made. We have these cases frequently and the x-ray helps at times, especially if it is a case of long standing. We recently made a diagnosis of a foreign body from the history and made a picture, which indicated that it might be in the upper right bronchus. It was removed from the left bronchus.

From the pediatrician's viewpoint we should be on the alert for foreign bodies, whenever we find a case with recurring periods of difficult breathing or violent coughing, with intervals of apparent comfort between attacks, and the absence of symptoms of an acute febrile condition. On account of the seriousness of the condition the x-ray as well as every other means of diagnosis should be used.

Dr. W. S. Lawrence, Memphis, Tenn.—Regarding the question raised by Dr. Gray about the difficulty of making examinations in children, I have tried this scheme: the trouble begins with these little fellows when you begin to put them on the table. They are all right when they come into the office, but when you begin to do something, they start to cry. They are generally brought by their mother or nurse or somebody they like. Let the mother or nurse hold the child and he is well contented. I arrange the apparatus beforehand. Then I let the mother stand at the foot of the table and put the screen across her chest; then tell the little fellow to hug mother around the neck. Watch the respiration and snap on full inspiration and you have the picture. You can make two or three plates and you are apt to get good ones instead of two or three poor ones.

Dr. A. L. Gray, Richmond, Va.—It is very hard to diagnose the presence of a non-opaque foreign body by x-ray plates alone. I have resorted to Dr. Lawrence's expedient many times. You have to observe the movements of the diaphragm. You can see a constant or a disappearing emphysema in the lung with the fluoroscope, but you may not see it in plates.

Dr. Phillips (closing).—If you do not find signs of obstruction on the first examination, do not say a foreign body is not present if you have a history indicating that it might possibly be there. Keep on making examinations until you are sure.

In answer to Dr. Arbuckle's question, I wish to say that bronchoscopy was attempted with a 4 mm. bronchoscope, but the bronchoscopist was unable to pass it through the larynx without doing damage.

We cannot emphasize early diagnosis enough, especially to the men who are seeing these cases first, the clinician and the general practitioner. The reason they do not suspect the possibility of this condition in some cases earlier than they do and do not know of the method of diagnosis, is that it was worked out by the x-ray men and published in the x-ray journals, and it has not been published extensively enough for the

knowledge to come into the hands of the profession generally, that it is not a rare condition and that it can be positively diagnosed.

In regard to Dr. Lawrence's discussion on getting the plates before the babies cry, ordinarily I do not like to hear a baby cry, but in these cases I prefer that the baby should cry in order to get the plate on a full inspiration. If the baby does not cry, it is well to make it cry.

I am glad Dr. Gray emphasized the point that we should use the screen with the plate examination.

MODIFICATION OF VAN SLYKE AND CULLEN AERATION BLOCK IN DETERMINATIONS OF AMMONIA AND UREA IN BLOOD AND URINE

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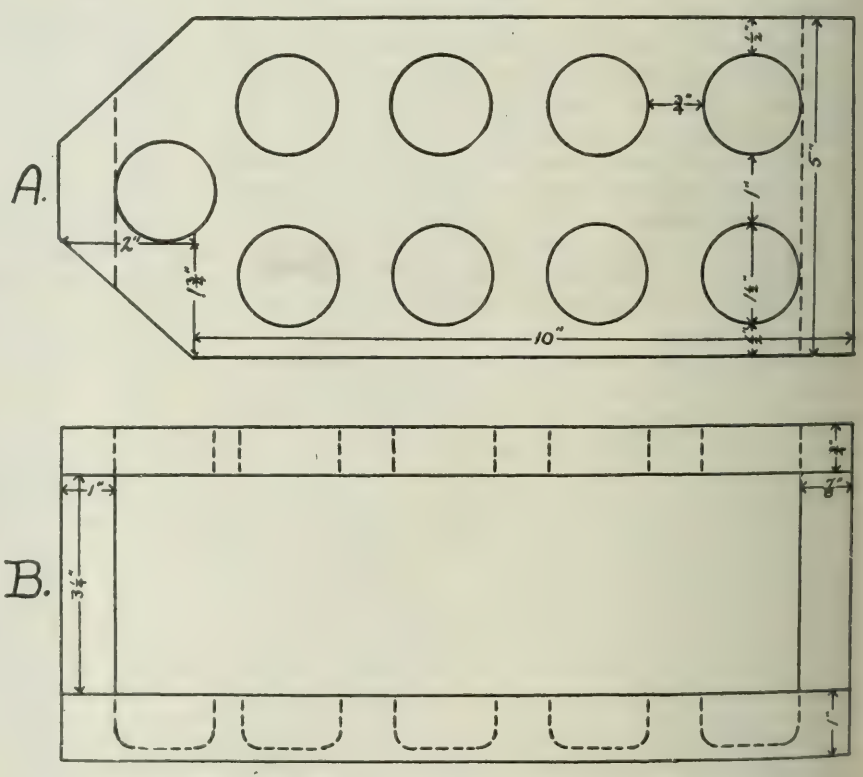
While conducting a series of research experiments involving the use of the Van Slyke and Cullen apparatus for the determination of ammonia or urea in blood or urine, it was found that the original aeration block possessed certain disadvantages. Among these are the following: (1) the impossibility of gaining any idea of the rapidity of aeration without withdrawing each tube separately and not using a manometer; (2) the degree of frothing cannot be readily observed; and (3) that the change of color of the indicator in the acid tube cannot readily be observed should an excess of ammonia be present. In consequence of remedying these deficiencies, the following open aeration "block" was devised.

According to the accompanying cut it will be seen that the open "block" consists of a top and bottom board containing a series of holes for supporting the tubes in proper place, each board being supported on end to give proper height to the block. Both top (A) and side (B) views are presented as well as general dimensions for their construction. The holes were made to fit loosely aeration tubes as purchased in the original outfit. As designed, the block is arranged to be able to run two sets of duplicate determinations.

With the substitution of this open "block" for the usual block as used in the Van Slyke and Cullen aeration apparatus, a more careful manipulation of the apparatus was accomplished without the customary raising of tubes for each observation. Where a greater number of determinations are to be run, a larger open block can be made by merely extending the design. With the full running of the apparatus a glance need only be made at it instead of the burdensome lifting of each tube to see how each one is conducting itself.



TROPICAL DISEASES AND PUBLIC HEALTH

SOME NOTES ON RECENT ADVANCES IN THE TREATMENT OF HOOKWORM DISEASE*

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The study of anything pertaining to hookworm disease is of direct bearing on the health of communities in the Southern states, where this disease is epidemic. This disease is now so more or less widespread that it has not the tendency to be limited to a particular class of workers.

Hookworm disease primarily is a disease of the tropics and semi-tropical regions. The method of spread and infection is well known and in farm districts of the Southern states the more or less primitive sanitary arrangements favor not only infection of the soil, but the preservation of the parasite. As a matter of interest it would be well to remember that out of a total of more than 500,000 men examined for hookworm in the United States Army, 11.3 per cent were found to be infected. In hookworm areas, the incidence averaged 17 per cent, rising as high as 32 per cent for certain Southern states. The *Journal of the American Medical Association*, in an editorial,[1] states:

"If one bears in mind the acknowledged deteriorating influence of hookworm infection on the health, education, industrial progress and efficiency of those who are involved, the national import of the situation becomes impressive."

The *Journal of the American Medical Association*,[2] commenting on the expedition sent to Trinidad recently to study the life of hookworm eggs and larvae in the soil, states that

"This expedition incriminates the pig as a carrier of this disease. Achert showed that eggs of the human hookworm developed as readily in pigs as man, thus making pigs a factor in the dissemination of hookworm. This expedition also found that there was in Trinidad a reduction of more than 90 per cent in the number of larvae in about three weeks after the elimination of soil pollution. Incidentally it is well to remember that the dog is also subject to hookworm disease and may act as a carrier."

*From the Medical Service, Station Hospital.

Sisco,[3] whose observations in Antigua, one of the leeward islands of the British West Indies, were conducted with the support and under the auspices of the International Health Board of the Rockefeller Foundation, in reporting a sanitary study of an area in which intensive anti-hookworm treatment had been carried on in 1915-1917, found on re-examining in April, 1922, that of 62.6 per cent of the persons cured in 1915-1917, the rate of reinfection in 1922 was 21.2 per cent. The primary rate of infection before treatment in 1915-1917 was 29.8 per cent. He also found that apparently 4.9 per cent were probably continued infections rather than reinfections. The only drug used in treatment was thymol. The number of treatments necessary before cure was effected varied from one to seventeen. It is interesting to note that in the case of only three of the number treated in 1915-1917 has hookworm been eradicated by one treatment of thymol. The experience at Fort Benning has been that it took, in the majority of cases, two or more courses of thymol or oil of chenopodium treatment to render a stool free of hookworm ova. The patient had to be hospitalized from three to four days or up to several weeks, with restriction of diet during treatment. Treatments were not repeated within one week's time for fear of causing toxic symptoms.

In the treatment of individuals infected with this disease, any drug which is more effective in its action than the drugs previously used, naturally is of benefit to the community. The reports on carbon tetrechlorid appearing the past year in the literature seemed to point to this drug as superior to those previously used. The first appearance in literature is a report of Nichols and Hampton in the *British Medical Journal*.[4] They relate the case of a murderer under sentence of death who volunteered to take 6 c. c. of carbon tetrachlorid, which was repeated thirteen days later. The execution took place one week after the second dose. Autopsy showed no hookworms or ascarids in the intestinal

tract. Sections of the organs were examined and showed no signs of degeneration. The students of an agricultural college were then each given a dose of 3 c. c. Not one of them was inconvenienced and all continued their usual work. Stool examination showed 90 per cent cured. Hall published the results of his experience with carbon tetrachlorid on thirty dogs.[5] He stated that in the case of animals given 3 c. c. of this drug for every kilogram of live weight a dose of 3 c. c. for an average size dog, all the hookworms originally present were expelled, a result he had never been able to obtain in any series of tests of anthelmintics on hundreds of dogs during the preceding six years. This author also tested thymol, chenopodium, chloroform and different combinations of these drugs. He found that a mixture of thymol and carbon tetrachlorid in the proportion of 1 c. c. of carbon tetrachlorid to 10 grains (0.648 grams) of thymol or carbon tetrachlorid, 3 c. c. to oil of chenopodium 1 c. c., were effective in removing all hookworms. He also found that carbon tetrachlorid was effective in removing ascarids.

Leach[6] reported in detail practically a year ago his experience in fourteen cases of hookworm, using carbon tetrachlorid as a vermifuge. He gave doses in size from 1.5 c. c. up to 10 c. c. at a single dose. One patient, a condemned criminal, received 10 c. c. of carbon tetrachlorid, followed one week later by 2 c. c. After execution a post mortem was performed and ozyurids were found, but no hookworms. Leach concludes that carbon tetrachlorid given in 10 c. c. doses produced no ill effects and removed all hookworms and ascarids. Docherty and Burgess, however, conclude after experimenting on two condemned men that a safe maximum dose seems to be 3 c. c., since they have given it in these doses without producing any ill effects. They found that 5 c. c. and 8 c. c. given condemned men on whom autopsies were done produced lesions of the liver. They, however, agree that carbon tetrachlorid seems to be practically specific for hookworms, fairly efficient in the removal of ascarids, lumbricoidis, oxyuris and vermicularis, but of little value in trichuria.

Lambert, who is a medical officer of the Bureau of Ankylostomiasis, colony of Fiji, Siwa, Fiji, reported his observations in the treatment of twenty thousand cases of hookworm disease by carbon tetrachlorid.[7] He concludes that carbon tetrachlorid is a vermifuge and vermicide of great potency, permitting of rapidly treating at low cost vast populations. Re-examinations of 823 treated individuals lowered the infection rate of 100 per cent to less than 9 per cent. His dose for adults is 3 to 4 c. c. Alcohol is a contraindication. In a later article,[8] reporting the results obtained in a total of 50,000 cases, he reports three deaths following the administration of carbon tetrachlorid, which was subsequently found to be far from chemically pure. One death in a boy aged seven years followed 1.75 c. c. of the drug, one in a boy aged five years followed a dose of 1 c. c., and a third death was in a child aged six, dose not given. Symptoms in these cases were semi-coma, tympanic abdomen, enlarged liver, pupils dilated, knee jerks absent with occasional clonic convulsions and trismus. At autopsy, the liver showed very severe necrosis of the central and intermediate zone of the lobules. Approximately one-half to two-thirds of the liver substances had been destroyed. Lambert concludes in this article that carbon tetrachlorid has shown itself to be the best vermifuge for the treatment of hookworm disease, but emphasizes the necessity for a supply of the pure drug.

As the results of stool examination at Fort Benning seem to indicate that at least 13 to 15 per cent of the adult population is infected with hookworm, any drug which would lessen the time required to hospitalize those infected would be of material benefit. The reports above considered and available on the action of carbon tetrachlorid would seem to indicate that it was superior in its action to other drugs, requiring few, if any, days in hospital for those treated. With this in view about August 1, 1922, a small amount of this drug was secured. Carbon tetrachlorid is a clear colorless fluid, having the formula $C Cl_4$, specific gravity 1.629, molecular weight 1538, boiling point 76° centigrade. It has a rather penetrat-

ing odor, reminding one of chloroform and carbon bisulphid. Its taste is so sharp and burning that the drug was administered in 3 c. c. doses in gelatin capsules. No fasting was done before or after administering.

Soldiers showing a positive stool for hookworm are not now as a rule admitted to the hospital, but are routinely given the above dose, cautioned against the use of alcohol and instructed to return for stool examination within a week's time. Following the administration of the drug some of them experience slight dizziness which may last two or three hours, a slightly drunken feeling and a sensation of heat in the stomach. The preliminary results were recently published in the *Military Surgeon*.[9] Further observations on the use of this drug in hookworm infection have given equally good results. Out of a total of 156 soldiers treated without hospitalization each received one dose of 3 c. c. of carbon tetrachlorid, only five positive stools have been found after reexamination, one of these in a laboratory worker at the Station Hospital, who examined the stools sent to the laboratory. This man may have been reinfected. Certainly the results so far have been superior to any other drug treatment, so much so that carbon tetrachlorid is now being used exclusively in the treatment of hookworm disease. However, one must bear in mind that drug treatment is not the only important factor in the treatment of this disease.

Darling advocates a method of so-called mass treatment in hookworm control, i. e., to treat by a germicide all the people within as short a period of time as possible so that soil infestation can be rapidly terminated. Sanitation bears an extremely important part and the possibility of animal carriers is not to be neglected.

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PUBLIC CONFIDENCE AND THE MEDICAL PROFESSION*

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It is evident to all practitioners of medicine that there is a distinct but indefinable element of misunderstanding between the public and the profession. I do not necessarily mean that the public distrusts the methods employed by the average physician in accomplishing his ends, but, owing to the fact that many diseases do not respond to treatment, there has grown up a sentiment in the public mind, especially among the enlightened, that there is an inadequacy in medical treatment. This state of affairs has brought about a condition of misunderstanding which some medical men regard as a distinct issue.

As a direct result of this, there has been developed an overwhelming demand for the practitioner of new fads and cults. Inasmuch as the fundamental idea involved, upon which the cures are achieved, is largely a matter of belief, it is difficult to differentiate between what is obvious charlatanry and what possesses the elements of rational mental therapy.

A belief is not capable of proof; it must be blindly accepted or rejected according to a state of mind. Nevertheless, the fact is indisputable that organic function is influenced by cerebral activity and to deny that such is the case is to be impervious to the experience of every-day life. It is this form of therapeutics which the regular practitioner, though employing it unconsciously in his own work, consistently disregards. He, therefore, lets down the bars to the charlatan and the cultist, who reap their rewards both in results and in shekels.

The fault lies not with the public, who, it must be admitted, are very prone to believe that which appeals not to their judgment but to their sentiments, but with the doctor who is not wise enough to respond to this demand. This is the point of stricture between the medical profession and the public.

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Faddists and cultists deal wholly with that part of the mental machinery which drugs fail to reach. Mental healers, chiropractors, osteopaths, represent experiments which society, having in its judgment found material medicine wanting, makes for its own good. Dr. H. C. Macatee, of Washington, D. C., believes that they exemplify the failure of the medical profession to grasp fundamentals.

A therapy which is material does not touch the illness of the spirit. It stops short of the spiritual alleviation which is so often bound up with the restoration of the physiological functions. There is a distinct tendency to be discouraged with the work of the doctor as a whole. I am of the opinion that the sneering, cynical attitude has been the stumbling block in the way of a proper appreciation of spiritual values by the practitioner and believe that it behooves him to study the situation and regard it from a more receptive attitude. He should look upon the body not only as a collaboration between cell entities, but as imbued with something deeper, equally real, if less tangible and far less understood.

One angle involving the confidence of the public in the medical profession is the development of specialists. The average person is confused by their number and variety and fails completely to grasp the necessity for their existence. He does not and cannot know that the fundamental sciences of chemistry, physics and anatomy, and their application to physiology, pathology and therapeutics, are continually making advances into new realms of knowledge. He does not appreciate the fact that as medical science evolves, clinical art becomes more and more complicated, and that it becomes increasingly difficult for the mind to grasp even the multitudinous fundamental details, or that the very complexity has evolved branches for which long and intensive training is necessary.

Some prominent men deplore the rise of specialism while granting that its development is logical. W. J. Mayo says that "Surgery should be put back where it belongs, a means of mechanical therapy in conjunction with medicine. . . ." Osler, in 1919, saw the danger in specialism when he wrote that,

> "Specialism has fragmented the specialties themselves in a way that makes the outlook hazardous. The workers lose all sense of proportion in a maze of minutiae."

Mr. Average Man sees the specialist as a person who demands a high price for a small amount of service which to him bears no relation to the remuneration. The result is that the specialist is viewed somewhat from the standpoint of the profiteer. Miller believes that this specialism tends fundamentally to destroy those intimate relations between physician and patient that constitute the very essence of the healing art. The analogy between the medical specialist and the specialists of daily experience, such as the plumber, the gas fitter, the electrician, whose services are accepted without demur, is lost sight of entirely.

A criticism of specialism, according to Miller, is that it has been responsible for the development of what might be termed class discrimination in the profession itself by which the general practitioner has apparently lost caste. Applied to patients, it has also fostered a feeling of class distinction. The charge is that the medical profession, as a whole, has rapidly become an organized, financial institution, which I may add Miller believes is "untrue and unjust." What the medical practitioner thinks is another story.

Another phase of medical activity which, if trouble were taken to investigate, doubtless influences the attitude of the layman and collectively of the public, is the "group clinic" or so-called "group medicine." It makes him think, inadvertently perhaps, of the abattoir where the pig goes in *in toto* and comes out changed in form and anatomical relations. Once more we have the chief objection to which the specialist is liable, viz., that there is a lack of understanding between the doctor and the patient; the psychological element of sympathy between the two is not likely to prevail to any degree.

The case passes from hand to hand until it runs the gamut of the group and comes out diagnosed and possibly treated. The process is in principle a mechanical one and, however we may value the virtues of

the system or even the end results, the effect on the mind of the patient is not desirable.

This is not in any way intended to disparage the institution of group practice. It is justified in my opinion by its superior facilities for study and diagnosis. When these facilities are transferred back through the patient to his family physician, it seems possible that the mechanical routine features of the process will not engender the same attitude of mind as when the patient is referred to specialists unknown to him. Of course, all group clinics are not devoted to diagnosis alone. In fact, some are arranged for treatment as well as diagnosis so that the patient may remain long enough under the care of one of the attending clinicians to become acquainted and, therefore, a species of mutual understanding may be reached.

In the third and last phase of the people's relation to the medical profession, that pertaining to public health measures, I think we may define the attitude as one of indifference rather than of distrust. The public knows only too well what it owes to the efforts of state and municipal boards of health to distrust their activities. Public enlightenment along the lines of prevention has gone far enough to counteract any active opposition to very necessary measures. In fact, there would quickly be a loud clamor were a health officer remiss in his duty during a typhoid, smallpox or bubonic plague outbreak.

Yet the same communities which will demand vigorously that an epidemic be stamped out after it has gained a foothold will be luke warm, not to say perfectly apathetic, toward changes in sanitation which would have prevented it in the beginning. It is the old story of the oblivious ostrich with its head in the sand.

I have in mind the present epidemic of dengue, and I could also cite numerous instances of remissness to authoritative warning. The shout for help as a rule comes too late when people have neglected to clean up their back yards, put in sanitary toilets, screen their cisterns, oil their ponds or vaccinate their children. Much suffering, loss of time and often loss of life results from just such a situation.

There is one other angle of public health measures which, because of its peculiar relationship to the private life of the individual, deserves attention. This is the problem of combating venereal disease.

In a way it is not difficult to understand that people should be indifferent, not to say hostile, to any procedure which deals with a phenomenon not entirely devoid of a sentimental background.

Experience has taught us that we meet with comparatively little passive resistance so long as the reforms we wish to have established do not contain a personal factor which penetrates not only into the life of the home but into the intimate relations of the two sexes. Regardless of the necessity for sex knowledge, and especially that part which has to do with venereal disease, there exists an indefinite fear tinged with hypocrisy and prudery which precludes frank and open discussion. Then, too, there seems to be an altogether false attitude of mock chivalry on the part of legislators which make the passage of laws dealing with prostitution an impossibility. The banality of "interference with personal liberty" is the cry when an attempt is made.

It oftentimes seems that the people regard the campaign against venereal disease, with the legislation which was effective only on the basis of Federal pressure, as obsolete, to be relegated to the limbo of past events.

That venereal disease still exists and that prostitution, which is its chief source of propagation, has not been eliminated seems not to be appreciated. Furthermore, it is neither known nor appreciated among the masses just what terrible havoc these diseases produce, and it is exceedingly difficult to make them know, because they seem not to want to know.

Of the two sexes one would surely expect women to be especially interested, because the great burden of destruction falls most heavily upon them. The explanation is that the intelligent part of the population is not mentally prepared because of prejudice, education or religious bias to receive the facts.

It, therefore, seems to be a question of time, propaganda and "watchful wait-

ing" for loopholes to offer opportunities for home thrusts, such as occur during times of epidemics before progress can be resumed.

As Miller very wisely remarks,

"The philosophy of medicine implies a cheerful acquiescence to the burdens of the day. It inspires the unfortunate and cheers the depressed. It teaches how to encourage the hopeless as well as the suffering. It provides courage and fortitude with which to meet sorrow and disappointment. Lived up to, it inspires a geniality of soul and tolerance for the opinion of others."

And I may add it is the philosophy which the doctor must of necessity accept if he wishes to keep the confidence, the sympathy and the affection of the public.

He cannot either financially or otherwise afford to act and speak contrary to the spirit of the times. It has been said that the practitioner is able and willing to give to the public far more than it demands. This is strong indication that he is ahead of his time; that the people, as a whole, have lagged behind and that general education has not kept pace with scientific education, that it does not prepare the public to understand great natural truths. In the last instance the mass is the arbiter of the destiny of the individual and willy-nilly the physician must bow to a demand which is beneath what he could supply.

The solution of the health problem and of the problem of public and professional relations is therefore not involved in difficulties which are incapable of solution.

I should say that both are analogous to two algebraic equations whose unknown factors are dependent upon those intangibles of every-day life which we commonly call confidence and understanding, confidence in the worthy motives of the doctor and understanding of the public's desires. It is in a coalition of needs with confidence and understanding that the solution lies.

DISCUSSION

Dr. W. S. Leathers, University, Miss.—All of us realize that at this time there is a great deal of reform going on within the ranks of the medical profession. In the ranks of the medical profession there is a feeling that the objectives of the general practitioner are being gradually and definitely changed. There is being developed within the ranks of the profession what is being termed "Group Medicine." There is also being emphasized an extreme form of specialization or, I might say, specialization in a much more extensive way than heretofore. There are physicians who are devoting their entire time to diagnosis, others to x-ray work, others to laboratory work, others who are specializing in surgery, in pediatrics, or in eye, ear, nose and throat. Indeed the field of medicine has been so broadened within the last quarter of a century that it seems almost an impossible task for a physician to devote himself to general medicine.

It is also true that during the past twelve years the prevention and control of disease has been more largely emphasized than during any corresponding period in the history of medicine. There exists at the present time among medical men a kind of unrest which is doubtless due to a number of things, but there is a tendency on the part of a limited number of physicians to account for this as due to public health activities which they think are detrimental to the profession. It is certainly a fact that the cause of the unrest among the medical profession is not being properly accounted for and, as a consequence, it is being explained on the basis of false issues.

It should be realized that those who are engaged in public health work constitute just as truly a part of the medical profession as those who are doing other lines of work. They are, therefore, just as much concerned in conserving the rights of the medical profession as any other group of physicians. The departments of health are the heritage of the medical profession, and every effort should be made on the part of the physicians of the country to maintain and sustain health organizations in the prevention and control of disease. There can be no question about the fact that it is the duty of the physician to assume a definite responsibility in this respect and become a part of the machinery of public health work.

The profession of medicine is too great an organization and has rendered too large a service to humanity for any serious conflict to occur between the profession and the public. Therefore, the attitude we should assume in public welfare movements should be liberal, broad-minded, and public-spirited.

Dr. Roy K. Flannagan, Richmond, Va.—What Dr. Leathers has said is true. No one has succeeded in keeping back the tide, though that has been an experiment of reactionaries as long as humanity has existed. It does seem to me a very poor business for the medical profession, with all of its enlightenment, to be fearing for itself because public health work is beginning to make inroads. Every enlightened doctor knew that public health work would make inroads upon his practice, though not necessarily upon his income. The very first principle of the public health man is that sickness must go. Now, why should doctors get panicky if it is necessary for public health officials to organize clinics of this sort, that sort, or the other sort, to take up the slack, to deal with people who would never be

looked after otherwise? Put yourself in the place of the public for one moment. Here are John and Mary and Jane and Tommy, who need attention. They will never be looked after. Who is to look after them? The doctor? Well, the people have no money to pay the doctor, so they go to the public health officer, and the health officer must do something about it. That situation will get worse before it gets better. Clinics must be formed, and it seems to me that the proper attitude of the medical profession is, as Dr. Leathers said, not to be fearful or afraid about the consequences of its own altruism. Its members started public health work, and they must take the consequences. Certainly the enlightened ones will back up public health to the limit, and wherever it leads I believe the profession will follow.

Dr. K. E. Miller, New Orleans, La.—Dr. Flannagan says that public health work is in conflict with the work of the medical profession, and that this is where the trouble comes. He says virtually that public health activities will take the bread and butter out of the mouth of the physician. Of course, so far as a few certain diseases are concerned, public health work has curtailed the work formerly done by the practicing physicians, as, for example, typhoid fever, malaria, and the like. But the work they lose is very small as compared to the increased business that comes to them by reason of local health work. If you analyze the program of a local health department you will see that the major portion of it plays directly into the hands of the profession. Take the school medical inspection work, for instance. We find children that need treatment. Who is to treat them? While we organize some few clinics, of course, and take care of a few children who would not otherwise get treatment, the effect of that clinic is in the nature of a demonstration as to what relief from physical defects means, so that correction of defects is popularized or advertised, with the result that the vast reservoir of defectiveness begins to move toward the practicing medical profession.

The same thing is true of the infant and maternity problem. The effort now is to see that the women get proper prenatal care, get proper attendance during the period of childbirth and puerperium. It is to the interest of the medical profession that the babies, after they come into the world, get into the hands of practicing physicians, well qualified men, whenever any danger arises. Our whole machinery tends to educate the public to get into the hands of the medical profession.

Take life extension work as another illustration. We know that the proportion of deaths from communicable diseases is coming down. On the other hand, the proportion of deaths from the so-called degenerative diseases is going up. Our whole object in the life extension work is to educate the people to go to the doctor while there is time to do something.

So it is throughout the entire program. Greater use of the medical profession on the part of the public is the dominant refrain in public health work. If we ever expect to develop a good feeling and cooperation between the profession and public health, we have to show them that the interests of the two are almost identical.

Dr. James A. Hayne, Columbia, S. C.—The great difficulty about the medical practitioner of the present day, the graduate of the present school, is that he has forgotten that medicine is a profession, that it is not a trade, not a money-making business, but that it is something he goes into as a man goes into the ministry, for the purpose of helping the public. The attitude of the laity at the present time is that they are being charged outrageously for very small services. Why do the public distrust the medical profession at the present time? Distrust of the medical profession is the attitude of a very large portion of the laity. Our American Medical Association to the laity is known as the greatest trust on earth, a trust that has actually gone as far as other unions to limit the apprenticeship by putting such a number of years on the man who wants to get into it as to require usually an enormous expenditure of money and four or five or seven years before you can make a medical man. The American Medical Association went on record in St. Louis for four things: first, that it is absolutely opposed to clinics of any description, whether subsidized by the Federal Government, by the states, by volunteer institutions, or by anyone else. Why is it opposed to clinics? Because this might hurt the profession's pocket book. The second is that the Association is in favor of the United States Government's taking charge of the liquor business. Third, it is opposed to the Sheppard-Towner act, because the act supplies money which may prevent the mothers and babies of the United States from dying.

That is why the medical profession is distrusted by the public. Why did this occur? Because in our building up of the American Medical Association we neglected to follow the fundamentals of constitution building laid down by the forefathers. States with a large number of practitioners can completely outvote and stifle the representation from states like North Carolina and Tennessee and Alabama. States like New York, Massachusetts and Pennsylvania have enough representation to outvote all the altruism of the South and West. There is absolutely no balance in the American Medical Association. It is simply a means by which the profession of New York and Illinois can express their egoism.

Dr. L. B. McBrayer, Sanatorium, N. C.—Men engaged in public health work should take serious account of the supposed friction between the people and the medical profession and between the medical men practicing for a fee and public health work. As Dr. Dowling so well said, the practice of medicine today is in a state of evolution, and I think that is a good omen.

Dr. Hayne, I think, ought to go to the United States Senate, and if I were living in South Carolina I would try to send him there. But Dr. Hayne's enthusiasm sometimes runs away with him. There is a tendency on the part of some

people to decrease the course of study of the medical student. They are fishing, you might say, for some way to get a person like a sanitary inspector, who will live out in the country with the folks and give them medical attention.

Medicine is quite different today from what it was even twenty years ago or thirty years ago, but there is a tendency to practice medicine today in the same way we did thirty or forty years ago, and the people are not going to stand for it. We are not using today in the practice of medicine the knowledge that medical science has brought to us, but are going along, many of us, as we did many years ago, and that is the thing to which the people object. A layman in my State said to me within the last few months, "I do not know what in the world we are going to do about the general practitioner. It looks to me as though we shall have to cut out the general practitioner altogether and employ specialists." He was groping for a way to have his people taken care of. Another prominent layman said to me, "Medicine is a science, but the practice of medicine, the application of medicine to the individual patient, is an art, and we have a great many mighty poor artisans in the medical profession."

I was talking to a well educated physician about this very thing and said to him, "Why don't you practice medicine in this town as it ought to be done?" He said, "I do not believe folks would follow me. I do not believe that I would get enough practice to make a living."

Now, the group medicine that we praise and condemn is an effort to do this very thing that is lacking in the medical profession, to examine the patient properly and give him the proper treatment. We have a patient in our Sanatorium today who has had two laparotomies, one for appendix and one for an ovary, and nothing was wrong with either. That is true too often.

Most of the friction that comes between the public health workers and the medical profession is due to lack of understanding. The medical practitioner has gone along without paying much attention to public health work, and does not understand it. The friction between the people and the medical profession is because the people are not getting from the medical profession what they are entitled to. They are groping for it, and a large number of them are being treated by the various cults that have sprung up.

Dr. Dowling (closing).—I agree with Dr. Leathers that when there is a better understanding between the doctors and health departments the health departments will have better cooperation. My experience has been that when doctors are taken into the confidence of the health department they are no longer opposed to the work the board of health wants done.

I believe that if we will take the people into our confidence and give them the service we should, we shall have a better, healthier and happier people.

One thing that we must educate the people about is making provision for the health departments. I found that a city was spending 22 cents per capita for health work and more than four dollars per capita for police and fire protection. I made the point that if they spent more for health they would be better satisfied and happier, and would not need so many policemen and firemen and so many courts, for they would not be burning up their homes and getting into trouble requiring the police.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

ANKYLOSIS AS THE TRUE CURE OF DESTRUCTIVE JOINT TUBERCULOSIS*

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My principle idea in presenting this paper is to bring into discussion some of the methods of treatment of the more severe cases of joint tuberculosis. We ourselves are, in some degree, ancestor worshippers, and we show it by our blind adherence to the rules of our medical forefathers.

In the treatment of bone and joint tuberculosis, the problems which are presented in the acute or early, and in the late or convalescent stage, are quite different. The principles of treatment employed to meet these needs are well understood and are easy to apply. In the early stages, the general problem deals with the attempt to preserve the function of a joint already attacked by a destructive disease, and all efforts are directed toward the arrest of the process before serious destruction has occurred, with the hope of preserving the usefulness of the joint. In the second stage, the disease has already destroyed the essential structures. We are, therefore, dealing with the remains of a joint in which normal function is not possible, and the problem concerns obtaining the best substitute for the lost joint, considering safety, permanency and practicability.

Experience has shown that in the early stages of tuberculous joints the disease may sometimes be arrested and the function of the joint preserved, in which case subsequent repair may be sufficiently complete to restore the joint to a useful status. But to obtain this result it is necessary that the arrest be made in the early stage of the disease, while there is still sufficient integrity of the joint to endure the added weight and strain of the more active life of later years.

In the past, there has been much controversy in regard to the relative value of different methods which should be used to accomplish this result, and the discussion has mainly been confined to the advocates of traction on one hand, and of fixation on the other. The claims made by the advocates have each been so definite, particularly as regards the results obtained, that one must come to the conclusion that these results are as much due to the intelligent and thorough application of the treatment as to the intrinsic value of either.

In carrying through a campaign of treatment the most important consideration deals with the decision as to in which cases, and at what time it is best to apply, methods which in themselves have stood the test of time and experience, rather than the blind adherence to any special method. For instance, in the acute stage, with spasm and pain prominent, and deformity increasing, the demand is for rest and for the application of those principles which have been proved by experience to relieve these symptoms. There is no treatment to which the symptoms respond so quickly as to that of definite and accurate traction. On the other hand, in other stages and with individual cases in which these symptoms are slight or absent, traction is not demanded; rather fixation, which may be then sufficient to supply the requisite amount of protection. But, whatever means may be used, it is essential to keep in mind at this time that the ultimate object is to obtain an early arrest of the disease before the destructive process has made enough of an invasion to impair the integrity of the joint structures. We know, unfortunately, how seldom this result occurs when the disease is once established, and it is, therefore, important for the intelligent conduct of cases to recog-

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nize when the stage has terminated, for then the ultimate aim of the treatment becomes distinctly different, although, perhaps, there may be no immediate change in the methods employed. In the one, the aim is to obtain a joint which retains the structures, which are essential to freedom of motion, such as unimpaired cartilage, normal contour of the joint lines, elastic capsule, etc.; in the other, in which these structures have been destroyed, and in which a joint allowing normal function no longer can be expected, the object must be to obtain as a permanent result a limb that will stand stress, and this result at the earliest possible date that is compatible with good treatment. In other words, we should not in this later period of the disease treat symptoms alone.

There is but one result which can be considered as an absolute and safe cure of a tuberculous disease which has passed into the destructive stage, viz.: bony ankylosis, in whatever position is most desired. The joint which has healed with a few degrees of motion (of very little added convenience) is under constant liability to repeated strain, limiting the capacity of the individual, giving frequent periods of disability. Accumulated experience gives the uniform judgment that such a joint fails to respond to the strains which are put upon it in later life, and must be looked upon as a source of danger. The patient is finally brought to a choice between, on the one hand, a life of very limited activity, and, on the other hand, a radical operation. Such a result often comes after a very long period of quiescence, perhaps after some years of limited activity, with an occasional mild attack of acute symptoms. The apparent cure may come after a long period of treatment, conducted tentatively, waiting for enough cicatrization and walling off by fibrous structures to allow the joint a beginning use, and in the end the imperfect remains of a joint results. Recognition of this fact emphasizes the need that the treatment should always have in mind a permanent and secure cure rather than a compromised result, which may carry the patient over the few years of moderately active life, but will not stand the strain which comes with increased activity, weight, and perhaps lessened resistance.

We know that an actual cure by ankylosis can take place. We must, therefore, ask ourselves whether too often we do not satisfy ourselves by meeting the present conditions rather than having in mind the future life of the individual. Our important question is, after the early period is over, Is ankylosis taking place? is the case progressing toward a secure and safe result which will stand the strain of later years, or, on the other hand, is the case only passing into the stage of quiescence of symptoms which will compromise the future active life of the individual? The object of the treatment should be to insure, in these destructive cases, our end result of bony ankylosis at the earliest possible period, and in those instances in which ankylosis is not taking place, the question of operation to bring about this desired result should be considered. In this relation, two types of cases exist.

(a) In which the area of disease is not directly attacked, and in which the operation is performed with the object of aiding Nature in producing an ankylosis. To illustrate this type, caries of the spine may be used.

With the exception of rare instances, tuberculosis of the vertebrae progresses to a distinctly destructive stage. Occasionally a case may be abortive and the function of the spine, as regards its mobility and ability for weight-bearing, may be distinctly preserved, but, in the usual case, the destructive process has invaded more than a single vertebrae, and a true bone ankylosis must be considered as the desired end result. Conditions which are necessary to obtain a true ankylosis in spinal caries cannot be definitely stated, but they are probably determined largely by the character as well as the amount of destruction of the parts of the bodies. In certain cases, ankylosis occurs spontaneously in the course of convalescence (See Fig. 1). In others, even under the same conditions, a true ankylosis apparently does not and perhaps cannot result. One must not be deceived by mistaking the early stages of quiescence in the convalescence as the actual occurrence of anky-

losis, for frequently symptoms may have so completely disappeared as easily to deceive the observer. The amount of time necessary to insure complete ankylosis would, necessarily, depend on the amount of destruction, the presence or absence or the amount of suppuration, and the general conditions favorable to repair. And this is true under all methods, equally of operative and of conservative means (See Fig. 2).

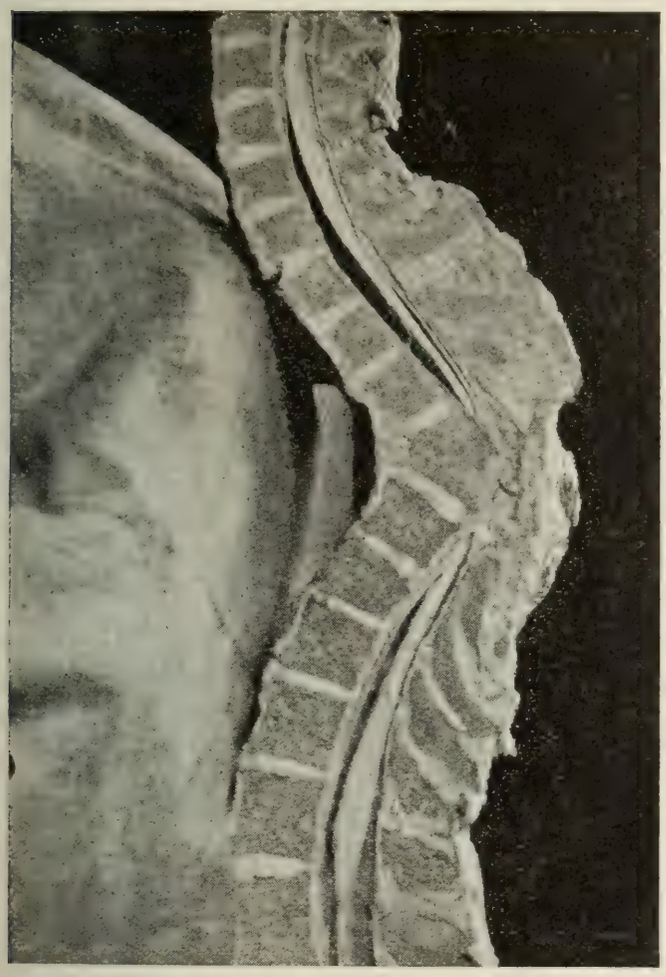

Fig. 1.—Old specimen of caries of spine showing a complete bony ankylosis. Destruction involving four vertebral bodies. Case illustrates the possibility of complete bony ankylosis by spontaneous cure without operation. Case must be considered as the type of true cure of destructive bony tuberculosis.

Fig. 2.—Tuberculosis of the bodies of the vertebrae with complete absorption and without extension of the destructive process to the contiguous vertebrae. Case represents the disease in childhood, early. At present without symptoms while wearing firm support. Case not in any way to be considered as cured or even safe without treatment by complete fixation. In view of the intact condition of the contiguous vertebrae, operation for ankylosis of the posterior portion of the column may not be necessary.

In the choice of operative treatment, when compared with or pitted against the conservative treatment, with the object of obtaining the same ultimate result, the reasons should always be considered for choosing the operative rather than the other, and the ankylosing operation should then be considered as the necessary adjunct to the other mechanical forms of treatment to aid in the same way as does mechanical means in placing the spine under favorable conditions for rest and healing. The object of the operative treatment in caries of the spine is distinctly different from ankylosing operations for the same disease in all other joints, for the reason that it must be used with the purpose to give an added mechanical means of support, and thus indirectly aid Nature to bring about those desired conditions which favor ankylosis, but without interfering with the diseased area; while in the operation to produce ankylosis in other joints the area of disease is directly attacked and the operation is performed purely with the object of producing an ankylosis at the site of operation.

In children at least, the conditions of environment must play an important part in the determination of the methods of treatment, for under proper conditions giving rest, protection, hygiene and time, a true cure may result. When all of these can be provided it should be a question carefully considered whether other than conservative treatment should be instituted.

The element of time is a factor in the environment. Experience has shown that operations directed toward producing ankylosis of the posterior part of the spinal column shorten the necessary time of

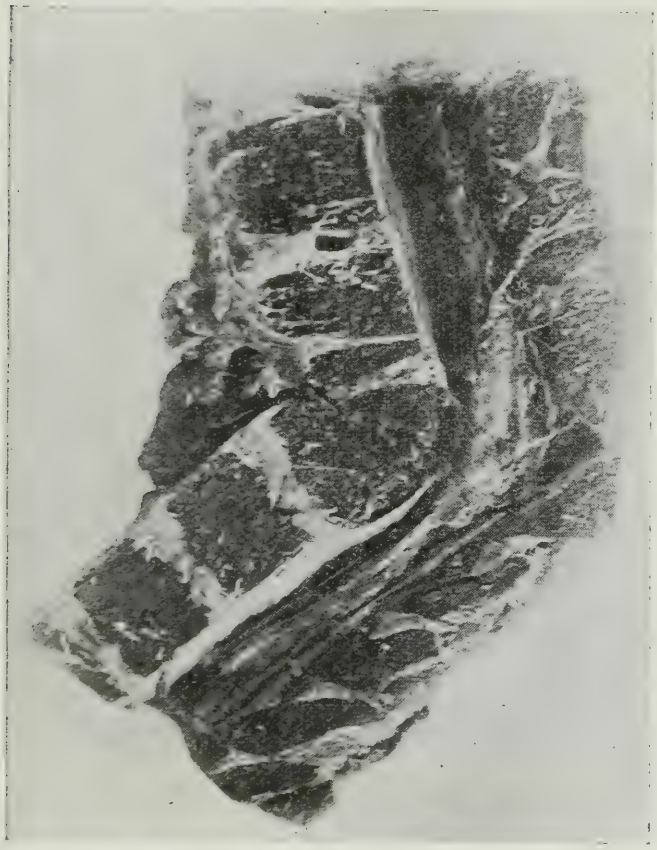

Fig. 3.—Incomplete ankylosis in case of extensive disease of the spine involving bodies of four vertebrae. A portion of the intervetebral disc is caught in the area of the disease. Ankylosis not complete.

treatment by mechanical support and fixation. In cases in which this time cannot be given, particularly if adequate support and fixation cannot be provided, operation is distinctly advisable. But the operation must be considered as only one feature of treatment, and not a substitute for the more important features of mechanical fixation and support. Moreover, in no way does it in itself prevent the increase of deformity.

However, in a certain number of cases a perfect ankylosis does not occur, and this may not necessarily be due to the lack of early persistent and thorough mechanical treatment. Clinical x-rays and the museum specimens all give evidence of imperfect ankylosis. Such cases are not secure and not safe for active life. It is probably not possible to define the conditions under which ankylosis does not take place. It is undoubtedly influenced, in part, by the degree of aposition of the fragments, the amount of intervertebral discs remaining as a foreign body, in many cases in the same way that fibrous or muscular tissue becomes interposed between the ends of the fragments of a broken shaft and thus prevents union (See Fig. 3). In any case, the condition can be studied by the x-ray and its progress determined. A failure of the development of ankylosis, not only eventually but during the course of the disease and after a sufficiently long quiescent period, must be considered as a distinct indication for operative interference in cases of caries of the spine.

In adults the problem is different and is more simple. True ankylosis rarely occurs in disease beginning in adult life. Mechanical treatment is always prolonged. Favorable conditions of environment are more difficult to control, and for these reasons operative measures are more generally indicated.

(b) In the second class of cases the area is directly attacked and the operation is done with the object of producing an ankylosis at the site of operation. For illustration of this class, disease of the hip joint may be used.

Passing from the first stage, in which there has been no actual destruction, and in which a functional joint may be hoped for, to the second, in which there has been an actual loss of structure, and the hope of preserving the function thereof is lost, the treatment must necessarily change in its aim, even if not in its methods. With whatever method may be used, one should question whether or not at the end of the treatment, perhaps of many years, a pure ankylosis is to be the final result. If so, the treatment must necessarily be consid-

ered as proper and efficient. On the other hand, if, after many years of conservative treatment, the patient is to be left with an imperfect ankylosis, a joint unstable and unreliable, although quiescent, one which eventually will fail to respond to the added stress of later years and remove the individual from an active life, already established under false pretenses, then the end result cannot be considered as successful. In these cases there should be considered the question of radical operation to insure the desired end result in regard to: (1) the necessity of an ankylosis operation,

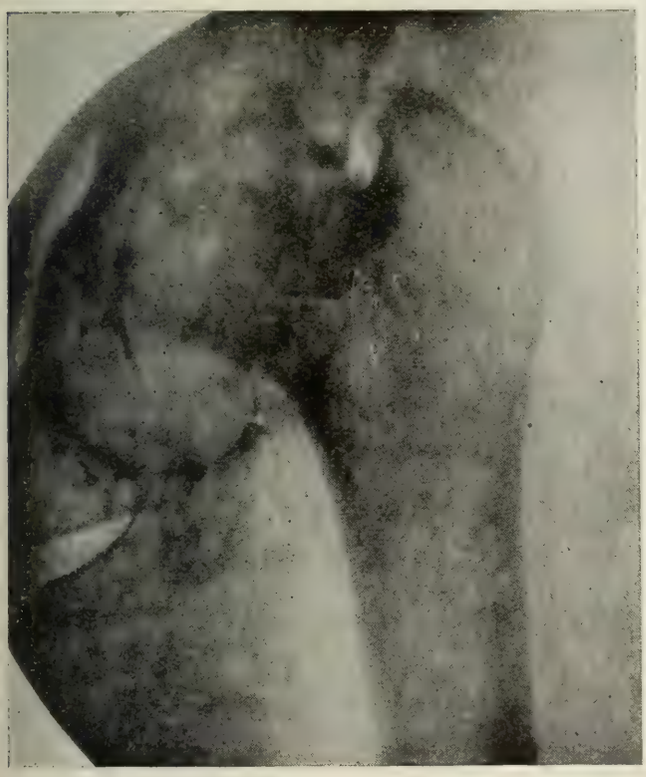

Fig. 4.—Old hip disease with destruction of the head and partial destruction of the acetabulum. A portion of the remaining head and neck in the old acetabular area. Fibrous ankylosis only. Case must be considered as vulnerable, presenting the danger of lighting up of disease with use. The only cure which can be considered as complete in this case is that of ankylosis.

and (2) the period in the course of the disease when it may best be done.

The following case will serve to illustrate this principle:

A man of 32, in good general health, a subject of old hip disease in childhood, applied for advice. The history was that of an ordinary attack of hip disease in childhood, with abscess formation, treatment by traction for many years, gradual disappearance of all symptoms, and a gradual resumption of the use of the leg during the later 'teens. At this period the patient was able to carry on his ordinary play and occupation and even engaged in some of the sports, as, for instance, pitching for the baseball team at school, apparently without restriction, and certainly without discomfort. At the age of 28, when engaged in clerical occupation, he began studying in night school, in addition to his day duties, and so continued for four years. The strain of this continued work, day and evening, finally showed itself in the deterioration of his general condition. A rather slight strain of the hip persisted in its symptoms, pain soon developed, and the old sinus reopened. The hip became and remained sensitive, enough to necessitate a cessation of work. At first the patient was able to walk a little and the hip showed a general condition indicative of a strain of an old joint rather than a lighting-up of an old disease. The disability gradually increased, and when seen the

Fig. 5.—Old tuberculous disease of the hip with destruction of the head and part of the acetabulum. Portion of the remaining head and neck in the old acetabular area. Ossification incomplete. Fibrous ankylosis. Impingement of the trochanter against the side of the ilium giving additional danger on account of the pry with the abduction of the leg. This case developed nearly complete disability after several years of moderate activity. Treatment should be that of operation for arthrodesis to produce a complete bony ankylosis.

patient was incapacitated for work.

Examination showed a leg in good position, short, allowing a very few degrees of motion and no thickening anywhere about the trochanter or about the joint. The x-ray showed an imperfect joint, no actual ankylosis, but a fibrous union between the irregular-shaped remains of the head

and the irregular remains of the acetabulum. There had not been sufficient destruction, and there was insufficient vitality to bring about a union, or perhaps the traction itself too long continued had given enough of separation of the fragments to prevent their union.

The history of this case is too often duplicated. It was a supposed cure of destructive diseases, which consisted of the establishment of the stage of prolonged quiescence with incomplete repair, allowing the resumption of a limited and temporary amount of activity, but with a final breaking down of the functions of the joint. A permanent result was not given to the patient, and this certainly cannot be considered as a cure. The operation which finally was necessary could have been done in the latter stages of convalescence, and the patient could have been given his permanent result many years earlier (See Figs. 4 and 5).

Another case in point illustrates the opposite in the desired result.

A case of hip disease began at the age of 10. It was acute, severe, and extensive. He had deformity, multiple abscesses, at one time thirteen sinuses, which required active treatment for several years. Later, on account of the social environment, active treatment was not carried out, but the patient used crutches for some years. They were then discarded and he took up a rather active occupation in his latter 'teens. This case was not seen for about fifteen years. At this date, the patient was 33 years old, well, active and had pursued an active life for fifteen years. He had had no symptoms, even with stress of work, and for a long period had worked sixteen to eighteen hours a day. The sinuses had closed at about the age of eighteen or twenty and had not reopened. The patient had a firm, bony ankylosis of the femur upon the ilium. The active and extensive disease had been followed by conditions favorable to a bony union and the head had not suffered enough destruction to offer too small an opposing surface on the ilium for a firm, bony ankylosis.

The one case illustrates the result which should be avoided and the other the result which should be sought for.

In the quiescent stage, after extensive destruction, the aim of the treatment in providing protection during the convalescent stage should be to aid in the final establishment of a true ankylosis. With the passing of the spasm, pain and increasing deformity for which rest with protection is demanded in these cases, and in which definite destruction has occurred, the object must be to bring the joint under those conditions which will favor this end. These conditions are apposition and rest, and the object then should be to allow the surfaces to come into contact with the best position possible at this time. We find, at times, our firmest ankylosis in cases which have had little treatment in the latter periods, although frequently the ankylosis is in unfortunate positions. If traction is too long continued, the object of treatment, namely, the apposition of the parts, is defeated by using the methods which are ordinarily employed to prevent union. When the general relations of the remains of the neck and the acetabulum have been maintained, the fixation of the joint is to be desired. At times it may be necessary to bring the leg into abduction to prevent the too great slipping upward, and again it may be advisable to allow the slipping by, because of the extensive or active process. No definite rule of action can be directed. The contention can only be that the ultimate result must be kept in mind during the quiescent stage and measures must be taken to obtain this end.

Not always is it to be expected that ankylosis will result spontaneously. Before discharging a case of this type, however, the question of giving the patient a secure result is to be considered. If the correction of deformity is to be considered and an imperfect ankylosis exists, the correction of the mal-position by arthrodesis rather than by osteotomy should certainly be chosen, when the structures are such as to allow this procedure. On the other hand, when the position of the limb does not call for correction, but an imperfect union exists as in the type already shown, the producing of ankylosis instead of sending the patient out into life with an unreliable joint should surely have careful consideration (See Fig. 6).

We know that ankylosis can be obtained in these cases. We also know that in the destructible cases less than bony ankylosis gives an insecure permanent result. Pure ankylosis, therefore, must be regarded as the ultimate and permanent cure, and anything less than this must be considered only as a stage in the convalescence, without reference to the length of time of treatment.

It may not always be possible to determine just when an ankylosis will occur, or in which cases an ankylosis may be expected. On the other hand, it is quite possible to determine during the long period of convalescence, and during the period of quiescence, whether or not the conditions present are likely to result in a bony union or a false joint. The question of operative interference to bring about this end result at a proper period, with

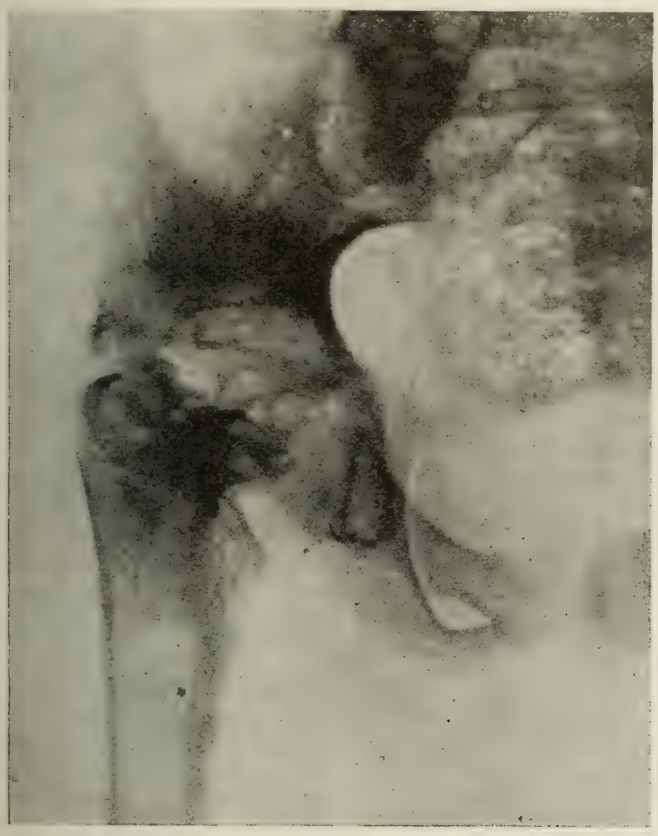

Fig. 6.—Old and extensive tuberculous disease of the hip. Destruction of the head and part of the acetabulum, but without complete ossification in the area of the disease. The case in the present stage, showing development of probable fibrous ankylosis. This case must be considered vulnerable and liable to strains in later life and one in which operation for arthrodesis should be considered before the cure is complete.

our increased methods of examination, should always be considered. Operation to produce an ankylosis is not justifiable in young children other than that for ankylosing the posterior part of the vertebral column. Neither can we say that the continued and prolonged seclusion and restriction of a patient necessitated by the treatment by apparatus, etc., unless it is to have the desired result, is justifiable. The case is more clear in adults. Disease originating in the adult period seldom results in bony ankylosis, and the period of seclusion and isolation is, in these people, one of greater importance and greater care should be taken to avoid this.

(1) It is not to be considered, however, that ankylosing operations are always necessary or even justifiable in destructive tuberculous disease. To promise success, there must be enough of opposing body surfaces to afford a sufficient area for a strong union. In certain cases of hip disease with extensive destruction, the

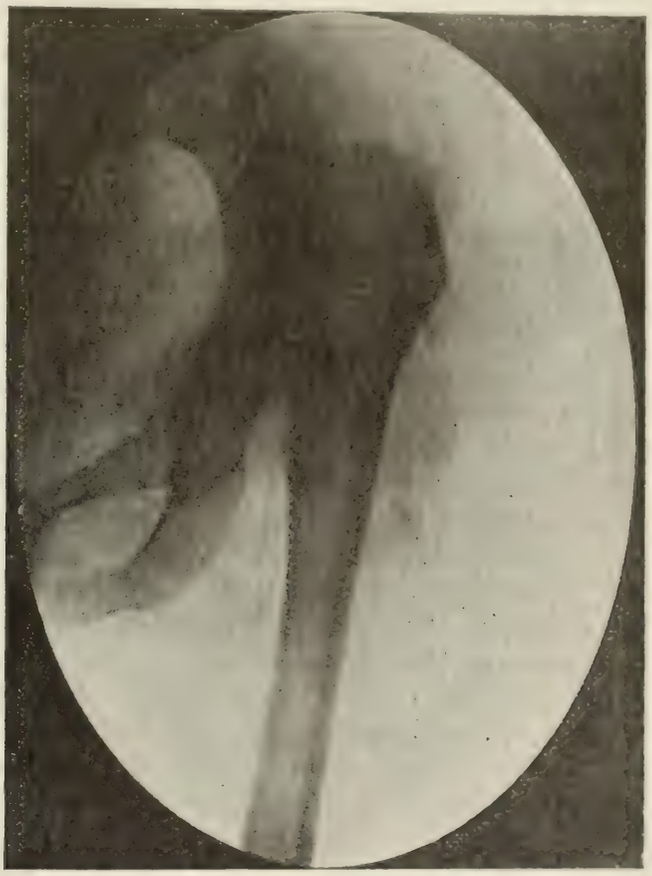

Fig. 7.—Old hip disease with complete destruction of the neck and nearly complete destruction of the acetabulum. Subluxation of the trochanter upward. The two opposing bony surfaces not directly involved in the original disease. A false fibrous joint allowing a large amount of motion. This joint has capacity for a definite amount of function, since the motion does not involve the old area of disease. This case illustrates a case in which bony surfaces do not present a sufficient area to obtain a firm ankylosis. Operation for arthrodesis is not indicated in cases of this type.

head and neck practically disappear, leaving the trochanter and perhaps a very small fragment of the neck, with the acetabulum so destroyed that it no longer presents a cavity of any depth. In these cases the trochanter is usually found well above the level of the acetabulum and opposing itself on or opposite the portion of the ilium just above the acetabulum,

which has not been a site of disease. The fibrous union of the two at this place is strong, sufficiently so to bear the weight of an ordinary individual, and a result of this kind usually permits a decided amount of motion, since two old diseased surfaces are not in contact, but rather two surfaces are opposed which have not been the site of disease, i. e., the top of the trochanter and the side of the ilium, and have, therefore, their normal covering (See Fig. 7). There is not the danger of strain, since the motion is sufficient to reduce the danger which comes to immobile false joints. On the other hand, there is not sufficient good bony surface in these cases to promise a firm ankylosis by operation.

The problem which confronts the surgeon today is quite different from that in former times, for the opportunities to obtain accurate knowledge along the course of a progressive case were never before so ample. One cannot be satisfied with a joint which is unstable and unsafe after long years of treatment, if, with beginning use, some radical measure is necessary to insure, at the late period, a safe and useful member, when the same or some radical treatment at an earlier stage would have given the same end result without the long period of restriction and seclusion. Decision for such a course of treatment was not possible before the perfection of the x-ray and other laboratory facilities, when the actual condition of the bony structure could not be determined and followed along in the course of the disease. But, with the perfection of these means, a new responsibility is now placed on the medical advisor, and it is necessary that he readapt his principles and accept responsibilities that could not have been placed upon him formerly.

The indirect but important and sometimes serious results of long conservative treatment are too often lost sight of until too late, and the lesson which intrudes itself while working among these cases is the need of clear foresight, looking toward final results, trusting that by the early recognition of these facts we may arrive at a decision in regard to the treatment which will not have too much the flavor of a compromise.

DISCUSSION

Dr. G. E. Bennett, Baltimore, Md.—We in Baltimore have been confronted with this problem and we have attempted an experiment upon a few children, taking very bad cases of fulminating, suppurating tuberculosis and attempting to produce ankylosis. Those cases seem to be doing very well.

Dr. Brackett showed one picture of complete destruction of the head and neck of the femur, with only a small part of the trochanter remaining, and said that these gave very satisfactory joints, and did not, as a rule, require attention, being very useful. That is quite true, but I do not believe that all are satisfactory. Some cases with the trochanter up under the gluteal muscles present a problem which I have not been able to solve. I have attempted to ankylose several, in order to do away with the hip strain which people develop when they are about thirty-five. I have two such cases now, and the best I have been able to get is a partial ankylosis, with some improvement. I would like to have Dr. Brackett tell us what he thinks of operating upon that type of case.

Dr. Frank D. Dickson, Kansas City, Mo.—I have been confronted from time to time with a condition of which Dr. Bennett has spoken, that is, practical destruction of the head and neck of the femur, with dislocation upward, which I have not been able to cope with to advantage. Dr. Brackett's paper is one that we shall go home and think about and discuss later rather than now.

Dr. Willis Campbell, Memphis, Tenn.—A point which we should consider carefully is too long traction. Dr. Brackett also emphasized this point: that after the acute symptoms have subsided, and where we are sure that the disease has reached the second stage, and we are certain that the joint will be destroyed, we should continue fixation but absolutely without traction. In my work I use heliotherapy, as some of you know. I have used it for a great many years and in a great many cases. I find that heliotherapy has a definite effect on the evolution of the pathological process. In practically all of the cases treated by heliotherapy, I do not mean over a short space of time or half carried out, but treated over one or two years, at least, we practically always have bony fixation, with an arrest of the active process.

Dr. E. Laurence Scott, Birmingham, Ala.—The spine cases usually come to us with some deformity. I remember eighteen years or so ago they were being treated in marked hyperextension. Now the tide has turned toward ankylosis. I would like to ask what Dr. Brackett does with the case that comes in with a mild hump.

Dr. F. W. Carruthers, Little Rock, Ark.—I wish to ask Dr. Brackett what procedure he would advise in children of about the age of ten or twelve who have a marked deformity, adduction with fixation.

Dr. Wyatt S. Roberts, Birmingham, Ala.—At the Children's Hospital in Boston, in 1916, we requested all the cases operated upon for tuberculosis of the spine to come back for observation. We were able to get fifty-five to report. These had been operated upon under the age of ten, and out of the fifty-five only one had been definitely improved by operation. Before ten years of age, in the usual run of cases, an operation for ankylosing the spine should not be performed. On the other hand, this operation offers much in older children and adults.

Dr. J. K. Simpson, Jacksonville, Fla.—Do the early symptoms of spastic paralysis in these cases make any difference in the indications for operation? Does that fact enter into the decision materially, or not?

Dr. Brackett (closing).—In treating these cases, difficult, prolonged, many of them distressing, we frequently carry them over the acute stage, and after the disease has become quiet we are satisfied to leave them in the later periods of convalescence and to consider this as the stage of cure. If we are to carry our treatment to completion, we must look at the end results and consider their condition when they become adults. The adult cases are constantly returning, perhaps more and more so, and the lesson is ever being forced upon us how imperfect early treatment actually has often been. Many of these people return, quite out of commission permanently, or until some radical operation has been done, while, on the other hand, they could have been made useful members of society if, at the proper time, the end result had been considered and the proper treatment had been carried out. This probably would have been the case if, in the course of treatment, the end result and the final life of the individual had been kept in mind as well as the condition at the immediate time of the treatment.

In regard to Dr. Bennett's question, I did not mean to make a statement which would have quite so general an application. Certainly the question which he has raised is very pertinent. No one type of treatment is uniformly, or can it be uniformly applicable. The kind of joint referred to is quite capable of giving a useful leg with motion, because in that case there are two bones, undiseased, opposed. (See Figure 7). This statement, of course, applies to those cases where there has been a complete destruction of the head and the neck with a dislocation of the trochanter upwards, so that the trochanter is practically articulating by a false joint on a portion of the ilium quite above the site of the disease. In such a case there exists a false joint which allows, under ordinary stress, a useful leg. In other cases, perhaps more extensive, the trochanter itself is invaded, and this type presents a much more difficult case to treat. These are not the conditions which are necessary for a firm fibrous union, and on the other hand there is not enough surface for ankylosis. We have all had the experience which Dr. Bennett mentions. Personally, I have never had satisfactory ankylosis with this type of case. The bone is fragile, is not good healthy bone, and there is not sufficient bony area to form a firm arthrodesis. Often a fibrous joint is better, provided the sinuses may be closed. Otherwise, one should never attempt an operation on these cases.

Dr. Campbell's remarks suggest a thought which we should take home with us. He has raised a point which needs elaboration. We have in the early stages, with existing spasm, pain and increasing deformity, no treatment which is so accurate, direct or successful as traction, and I believe we should apply traction continuously so long as these symptoms exist. When these symptoms have receded and there is no longer pain or increasing deformity, we have but one thought: to bring about ankylosis as quickly as possible. If we apply traction to these cases continuously, keeping the involved surfaces apart, we are accomplishing the opposite of what we really wish, viz.: contact for bony ankylosis. If, on the other hand, we remove the traction and allow the bones to come together and permit the muscles gradually to bring these surfaces into contact, we introduce the conditions for an ankylosis, and therefore this should be considered.

In regard to treatment of spinal disease in children, with the object of diminishing deformity, I believe our course should be clear, for we should never, more than possible, separate the bodies for the sake of the position of the spine. Our aim is to obtain our ideal end result, and we know that a strong ankylosed body, or series of bodies, with a certain amount of deformity, is a better result and allows a more active individual than an unankylosed area with less deformity. This does not mean that we should try to increase deformity or not to prevent it, but we should try to bring about as quickly as possible an ankylosis, and for such ankylosis we must have contact of bony surfaces. The operation for ankylosing the spine is not an operation for directly ankylosing the disease area, but merely to supply an added mechanical support. In children, and in cases which can be given ample time and proper environment and thorough treatment, it is wiser to delay operation until the older age. As was determined by the Commission appointed by the A. O. A., the operation apparently does cut down the acute period, and therefore saves time. In some cases this is certainly an important consideration.

Some one has asked about the reduction of deformity in a child of twelve years with a quiescent hip, but with marked adduction and flexion, in the stage of quiescence or fibrous ankylosis. I remember very well that I asked Dr. Schoffer, of New York, that very question, and I have always remembered his wise answer, which was: "I believe we should treat our cases so as to heal them as quickly as possible, irrespective of deformity, and when we have ankylosis correct the deformity." If we have developing and increasing deformity, we should then have in mind the operation, even if we know that later it will have to be repeated. But unless there is an increasing deformity of the spine as a result of the leg deformity, we should wait until the child has obtained his growth before operating.

CONCLUSIONS AFTER SIX YEARS' USE OF RADIUM*

By E. Dunbar Newell,
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Chattanooga, Tenn.

In our Clinic, radium has long been an adjunct to surgery. We have employed it with the instinct of the surgeon and not as radiologists primarily. Where we found that radium would improve our surgery, lower our mortality, lessen our morbidity, add to the comfort and happiness of our patients and decrease the cost of illness we have utilized irradiation with avidity and pleasure. We pity the surgeon who has not the sense or the opportunity to avail himself of the great opportunity to benefit and cure many of his patients by utilizing radium treatments, and we more than pity the patient who has to be treated with radium by a radiologist who is a technician and who is not working under the guidance and direction of a surgeon. In our six years of clinical work with radium we have been profoundly impressed with both the marvelously brilliant cures and the possibilities of great evil. The gravest criticisms against radium have not been against the properties of the metal, but indictments against the improper use of radium. Our success with radium has increased month by month and year by year as we have become more familiar with its properties, have studied closely and accurately our own clinical records and the records of other clinics, and have refined our technic of application.

During the first three years that we used radium we operated upon our operable cases of carcinoma of the cervix, the borderline cases, some we operated upon and some we radiated. The inoperable cases, the hopeless cases, we treated all without exception with radium. It was the apparent cures that we got after using radium in some of these bed-ridden, emaciated, cachectic, bleeding, foul-smelling, hopelessly inoperable cases, that convinced us of the great value of radium. We then began to use it in the borderline cases and during the past three years we have considered that the indication for radium in carcinoma of the cervix was carcinoma of the cervix whether in the operable or inoperable stage. Our mortality has been greatly lowered since we have adopted this procedure. We are convinced, too, that we see these cases much earlier than formerly now that these patients have not the same dread of the diagnosis of carcinoma of the cervix with the associated major operation, the long confinement to the hospital and the almost hopeless prognosis. In this Section the profession and the patients have been quick to realize that the treatment of carcinoma of the cervix by irradiation is without primary mortality, that it causes very little suffering when properly done; that they are in the hospital but a few days and that it is only rarely necessary to use a general anesthetic. Up to January 1, 1922, we had treated with radium fifty cases of carcinoma of the cervix and when the five-year period is covered we shall give our tabulated records.

In fibromyoma of the uterus we have had some strikingly favorable results, but we have selected these cases with care and caution. We do not believe that radium should be used when the fibromyoma is larger than a four months' pregnancy, except to control hemorrhage to prepare the patient for operation. The submucous and the pedunculated varieties of fibromyoma do not respond to radiation. When we have uterine hemorrhage due to fibromyoma not of the submucous or pedunculated varieties, and when there is no pelvic inflammation either acute or latent, regardless of the age of the patient, radium with us has been almost a specific in relieving these hemorrhages. We do not use it from preference in the absence of hemorrhage to treat fibroid tumors of the uterus. We think that a radical operation, if there are no contraindications, is the procedure of choice, but when we have used radium to reduce the size of the tumor it has been very effective, although slow and prolonged. One can always prevent permanent amenorrhea or

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abrupt menopause by a very careful and guarded application of radium. If small doses of radium do not control the menorrhagia and metrorraghia in fibromyoma in young women, there is no operative mortality, no morbidity, no confinement to the hospital and operation can be resorted to at any time if required.

Uterine hemorrhages without definite definable causation in young women or women about thirty-five, where the usual hygienic and therapeutic measures have been resorted to without relief of the menorrhagia or metrorrhagia, have, in our Clinic, been cured without exception by radiation. We have classified under this heading about fifty cases that we have so treated. This treatment to us seems so simple and so effective and so free from danger that we do not believe that major surgery in these cases should even be considered. In none of these cases did we have a permanent amenorrhea or a sudden menopausal cycle when it was not desired or unlooked for following the radiation. Thirteen of these cases were under thirty-five years of age and the youngest one was fourteen years. In the young woman, repeated small doses will prevent destruction of the ovaries. However, two applications are usually sufficient to stop the menorrhagia and metrorrhagia. In women over thirty-five who have a family, where the sexual life has been well established and who have not a high strung nervous temperament, one application of radium can be given with the intention of producing a permanent amenorrhea. The proper application of radium in these cases is the only question involved.

Epithelioma of the skin of both the squamous cell and basal cell type, where there has been no involvement of bone and mucous membrane, in a very large series of cases has almost invariably been cured by radiation. Epithelioma of the lip we believe should be treated with but a few exceptions by surgery with radium as an adjunct.

We have cured four cases of urethral caruncle of long standing with radium. Two cases of epithelioma of the penis we have cured with radium.

Sarcoma of the soft parts is often spectacularly cured with radium, but in sarcoma of the bones our results have been almost negative.

We believe that hyperthyroidism is a surgical condition today and that surgery is the treatment of selection, but we have gotten some favorable results from radiation in these cases where operation has been refused.

Radiation for keloids with us has always resulted in cures. Radiation for the various types of angiomata is far more satisfactory than is surgery for these conditions.

Radiation for non-suppurating tuberculous glands is very satisfactory and leaves less scarring of the skin than does surgery.

In conclusion, we believe that radium is used in many pathological conditions where it is positively contraindicated and that in far more cases radium is improperly used. Yet we have in this rare metal or some such metal yet to be discovered with greater penetrating power than radium, or in some apparatus that will produce rays similar to radium emanation, our greatest hope for the cure of cancer.

DISCUSSION

Dr. W. S. Anderson, Memphis, Tenn.—We have had, as Dr. Newell has brought out, quite a bit of antagonism recently against radium. I think it is brought out by men who are not familiar with radium who have used it unsuccessfully. Radium is not an antagonist to surgery, but should be used hand in hand. In many instances radium can be used where surgery would be a decided risk. One type of case in particular which was not brought out but in which to my mind we get really spectacular results is the case of the new-born infant with an enlarged thymus gland. In a case seen recently I was called in consultation late at night. When I reached the bedside of the mother the nurse had the child lying with the head turned down because if it lay face up it gasped for breath and turned blue. When I was called I was told the type of case I was to see, so I carried my radium with me. The gland began to shrink within a few hours and the child breathed more comfortably. In that case the radium was used to quite a definite advantage because the child was so small and the symptoms so alarming that it could not be taken to the x-ray.

Men working with both x-ray and surgery have concluded that carcinoma of the cervix is a type of disease in which we should use radium

and x-ray and abolish the use of surgery. We know what the mortality was formerly, and we know there is no mortality from the use of radium and that the results of this treatment far surpass what we had from surgery. It is wonderful what we can do in cases that come in with foul, stinking, cauliflower masses, with the blood count down to about 2,000,000. The odor will disappear and the blood count go up to normal within a few months' time, with marked improvement in the woman's general condition. All early cases should have radium even though some men resort to operation. In my work I have given up operating and use radium alone.

I heartily agree with Dr. Newell regarding the use of radium in fibroid of the uterus, but it should be limited, as he brought out, to those types where there is no pathological involvement of the appendages or where the growth is not larger than a three or four months' pregnancy. When they are larger than that the case becomes surgical. All types of malignancy of the fundus are surgical. In the fibroids where the patients are markedly emaciated from a large or continuous bleeding, radium can be used to good advantage to get the patient into better condition for subsequent operation.

Dr. Newell (closing).—There are many cases in which we use radium which I have not indicated because I wished to give you only our general conclusions about the type of case we are using it on. I think our Clinic is following pretty closely the other clinics in the country and in Europe, except that some of them are very radical and we have not resorted to such radical measures. In many instances radium is used where it does the patient a great deal of harm.

PREGNANCY WITH AN IMPASSABLE VAGINA: CASE REPORT*

By R. M. Wilson, M.D.,
Southern Presbyterian Mission Hospital,
Kwangju, Korea.

We have thirty-two American mission hospitals in Korea, the little country now under Japanese rule, and we are trying to enlighten these people as we can. Some of the most horrible things I have seen have been along obstetrical lines.

The Oriental woman after the child is born gets up at once and goes to work. Consequently we see many cases of complete prolapsus, of women coming in with the uterus down between the legs. The Oriental treatment is to take pure nitric acid and apply it to the uterus, cauterizing it and then replacing it, and sometimes complete adhesion follows. Of course occasionally they become pregnant through a small opening, and we have all kinds of deformities resulting from this. Often these women's vaginas are entirely destroyed. In one case of a woman pregnant in this way, she could not come to the hospital, the child died at labor, and finally after she had become much emaciated they brought her to me.

As result of the cautery the vagina had been obliterated by scar tissue, and at labor it was impossible for her to bear the child. It died at labor and then began to decay. Four months later she was brought to our hospital with a very foul smelling condition. I dilated the small opening and removed from the uterus the bones, hair and some remnants of tissue, the balance of the child having passed out before in a purulent form.

The patient was very much emaciated, but after being a week in the hospital returned home. The mystery to me was how she could exist through this long period of decaying process that took place in her body.

Dr. Patterson at Kunsan has done four consecutive cesarean sections on one of these cases of scarred vaginas.

I often do cesarean sections because of this deformity of the vagina, although I have found that I get better results by cutting below and entering the uterus or by vaginal hysterectomy. Many of these cases have been tampered with and are infected and the abdominal route not safe to enter.

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INTESTINAL OBSTRUCTION*

By T. W. Holmes, M. D.,
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Intestinal obstruction, while not necessarily fatal, is always a grave condition. Its gravity is threefold: it is dependent not merely upon the local obstruction to, and arrest of, the fecal current, nor upon the interference with the free circulation

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of the blood in the affected segment of intestine, serious as both these conditions may become, but upon constitutional symptoms, the result of absorption of poisonous products from the upper intestinal tract.

This paper is based upon the findings of some 200 cases of acute intestinal obstruction that were operated upon and that came under the service of several surgeons.

With the exception of intussusception, age played no important role. However, sex did, the condition being found more frequently in the male. Race played a rather important role, the proportion being two colored to one white. Negroes were more subject to intestinal obstruction than whites, possibly because of the fact that pelvic inflammatory diseases with resulting adhesions are much more common in that race.

In going over the different operations performed and the circumstances under which they were done, as they varied from such simple procedures as the untwisting of a volvulus or division of a constricting band to resection of several feet of gangrenous bowel, one finds that the result depended far more upon the condition of the patient at the time of operation, and was in direct ratio to the time of onset rather than to the operation itself. Other things being equal, the cases of resection compared very favorably with the simpler forms of operation.

The shortness of the interval of time elapsing between the onset of symptoms and the operation played a most striking part. Of 38 cases operated upon within the first twelve hours from the beginning of the symptoms, there were 36 recoveries and 2 deaths, a mortality rate of a little over 5 per cent. The mortality rate steadily increased as the interval of time elapsed. Thus the cases operated upon in the second twelve hours advanced to 11 per cent and the ones operated upon in the second twenty-four hours to 31 per cent.

Obstruction may occur at any place along the intestinal tract and may be acute or chronic, complete or incomplete, and due to a number of causes, chief of which are adhesions of inflammatory origin, intussusception, volvulus, foreign bodies, internal strangulations, intestinal parasites, bands, kinks, twists, post-operative or not, paralysis, tumors and congenital defects.

Intestinal obstruction may at times be simulated by other conditions, viz.: typhoid fever, Henoch's purpura, certain infections, appendicitis (particularly of the fulminating type, in which there is a paralysis from toxemia), twisted pedicle of a tumor, lead colic, gallstones, mesenteric thrombosis, diaphragmatic pleurisy, meningitis, etc., which make a diagnosis at times not an easy matter. The consoling fact, however, remains that practically all the conditions with which this is likely to be confused demand operation almost as imperatively as intestinal obstruction, and where the possibility of an acute intestinal obstruction is raised, with the condition growing progressively worse, immediate laparotomy should be done without delay.

The clinical picture of acute intestinal obstruction is fairly constant and characteristic. When all the classical symptoms are present diagnosis is very easy. Unfortunately they are not always present, as in the post-operative variety.

As for the symptoms, pain is the most important one, being of sudden onset and colicky in character at first and becoming more continuous with increasing severity.

Constipation is usually present, but may be preceded by one or more bowel movements, merely emptying the bowel below the obstruction with total obstipation following. This is especially true in cases of high obstruction. The exception to this symptom is intussusception in which the bowel movements are frequent and contain blood and mucus.

Usually more or less shock is present, and if it accompanies the early manifestations of obstruction, one may be certain the segment of intestine involved has been pretty badly used, so that its blood supply has been seriously interfered with and its lumen obstructed. These symptoms may be mild at outset with increasing severity, which means that the obstruction was incomplete or partial at the beginning, but has become complete.

Distention, although a fairly late symptom, is usually a constant one, depending on how high up the obstruction is. The higher it is, the less the distention. It is usually asymmetrical with high obstructions and symmetrical with the lower ones.

Visible peristalsis is rarely observed early and is usually well developed in proportion to the length of time that the obstruction has persisted. The same may be true of borborygmus, which seems to be associated with at least a moderate degree of hypertrophy of the intestinal wall. Auscultation reveals increased peristalsis.

Vomiting is fairly constant and next to pain in frequency. At first it consists of the stomach contents and is followed by bile-stained mucus and fluid from the duodenum and upper intestinal tract, becoming stercoraceous later.

Hiccough is a frequent accompaniment of this latter stage. Tenderness is largely dependent on the character and the location of the obstruction. Tenesmus and movable dullness are only occasional symptoms.

As the condition progresses, the patient who at first may have shown few signs of serious illness begins to develop in addition to his pain and vomiting a certain symptom complex that is very definite, viz.: anxious expression, pallor, cold sweat, sunken eyes, rapid pulse, subnormal temperature, dryness of mouth, severe thirst, scarcity of urine, which frequently contains large amounts of indican and an excessively high leucocyte count. Death usually supervenes in a few days to a week, if operative or other relief is not forthcoming.

Certain varieties of intestinal obstruction are more difficult to diagnose than others, and at the same time more amenable to treatment. This is especially true of foreign bodies such as gall stones or intestinal parasites impacted in the lumen of the bowel.

Intussusception is fairly easy of diagnosis. The passage of bile-free mucus stained with blood and accompanied by marked tenesmus and a sausage shaped tumor in the abdomen in a child previously healthy, points conclusively to a diagnosis of intussusception. One case was reported in a child one month premature upon whom two days after birth operation was performed and followed by complete recovery.

The sudden onset of colicky pains of increasing severity in a middle-aged or old person who has been troubled with constipation, and especially in persons with large pendulous abdomens, accompanied by early and marked distention, suggests strongly volvulus of the sigmoid.

Post-operative intestinal obstruction is one of the calamities of modern surgery. After the patient has undergone the mental and physical strain of a severe operation and is just beginning to feel that he is convalescing and has passed the danger period, to be informed that he must undergo another operation for obstruction, taxes his fortitude almost to the breaking point as well as to the uttermost his powers of physical endurance.

Here as elsewhere, prevention is far better than a cure. I do not make the statement that all cases of post-operative obstruction can be prevented, for they cannot, but their frequency can at least be reduced.

It is a common belief that at least temporarily adhesions take place any time the abdomen is opened. Probably most of them absorb, or in some way disappear in the course of time in those cases where there is prompt and complete healing. Where, however, there is a continued irritation, for instance a low grade inflammation from whatever cause, these adhesions will not disappear, but will be found to have become organized and often dense fibrous bands will result. These are not an infrequent cause of the obstruction's occurring late. The early ones are due to localized peritonitis, the result of infection in the wound tract or not infrequently to foreign bodies such as drains, especially unprotected absorbent gauze stuffed in large quantities into the wound, and they are productive of extensive adhesions along the drainage tract which in turn under favoring conditions may give rise to intestinal obstruction.

Statistics may vary in different clinics, but it is safe to say that approximately one-half the cases of intestinal obstruc-

tion occurring both in hospitals and private practice have their origins in adhesions resulting from previous operations. Why is this? Is it because of the circumstances inseparably connected with any mechanical procedure involving the opening of the abdominal cavity and the handling of the peritoneal and raw surfaces, or is it caused by the very condition which called for the operation, or is it due to faulty technic, giving rise to undue trauma of the tissues, or to infection, or the presence of foreign bodies, as drains left in the tissue, causing continued irritation to the peritoneum, or to some combination of these factors?

So far no satisfactory explanation has been observed. Every one is familiar with the fact that in many cases where one could reasonably expect adhesions to form, few if any do, while in other cases without apparent reason many dense adhesions form and persist. Whatever may be the best reason for this, it is probable that the two most potent factors at work are the presence of a persistent low grade inflammatory process, the result of infection, and the presence of some foreign body in the tissues such as a drain.

The potency of the latter factors is abundantly proven not only experimentally, but by the marked reduction of late years in the relative number of cases of post-operative obstructions, due largely to the better observance of the fundamental principles, e. g.: gentle handling of tissue, surgical cleanliness, discontinuance of the use as drains, of large amounts of unprotected gauze, and repeatedly removing and replacing it, the avoidance of unnecessary drainage of any kind, and the use of strong antiseptic solutions in the abdomen such as tincture of iodin, etc. Five of our cases gave a history of having had their abdomens irrigated with tincture of iodin following operation for peritonitis.

Not much dependence can be placed on artificial aids, such as the application to the peritoneal surfaces of ointments or membranes and the like. Frequent change of position after operation and the early establishment of peristalsis by means of pituitrin promise more than anything used at present.

Paralytic or adynamic ileus is possibly more common than usually believed to be, and more commonly follows operation upon the appendix, pelvic organs, kidney and urinary tract.

At first these cases do not appear very ill. Abdominal pain is not marked, nor is the pulse rate much increased, and there is little evidence of shock. Vomiting usually occurs early accompanied by little nausea. It is at first copious and consists of fluid mixed with mucus, later of the intestinal contents with a fecal odor. Auscultation of the abdomen reveals no gurgling. The passage of the stomach tube in doubtful cases, where mechanical obstruction is feared, may furnish valuable information as to the character of the stomach contents, and followed by repeated lavage may be of great benefit. When intelligently used it may prove the means of avoiding the reopening of the abdomen or it may even become a life-saver.

The etiology of this condition is still in doubt. The picture in the well developed cases is rather that of a true paralysis of the sympathetic nervous system.

Not every case of acute intestinal obstruction should be operated upon regardlessly. The nature of the case, the length of time that elapsed from the onset, and the condition of the patient, which is in direct ratio to the length of time, are all determining factors to be worked out. Of course, every case that comes early should have a laparotomy and the offending obstruction be removed. The late ones are the puzzling ones, and the one essential is to give the patient the very best chance for his life.

We are very much indebted to the Dagstedts, Murphy, Brooks, Whipple and Stone and others for their untiring efforts and works in connection with the toxic agents produced in acute intestinal obstruction. Through them our knowledge has been much broadened in every way, especially with reference to medical and surgical treatment.

The operation of enterostomy as devised by Nelaton is certainly a life saver and has been very little improved upon

with the exception of the introduction of the rubber drainage tube instead of merely opening the bowel.

It is rightly claimed that the cause of the high mortality of about 50 per cent in acute intestinal obstruction is that the operation is performed too late. That is true, but even when performed late, it can be greatly reduced if the principles of a properly performed and properly located enterostomy can be carried out.

Victor Bonney, in 1910, published a paper advising that instead of following out Nelaton's injunction the jejunum be opened for this purpose. He divided the intestine into three segments, the lower, middle and upper. The lower more or less collapsed. The middle contained gas; the upper, fluid. The character of the vomitus indicates the height of the fluid-containing segment. When feculent, the stomach is the highest part. At first in all types of obstruction, whether in the small or large intestines, the vomitus is simply the stomach contents; later in all types the vomitus becomes feculent and the stomach and the jejunum are in the segment of toxicity. "This upward extension of the limits of the fluid-containing segment is due to a rapid upward extending infection of the canal by organisms of the lower intestine. The current in the intestinal tract has become reversed and the drainage must be established in the highest fluid containing segment. The drainage in the jejunum causes an inevitable cessation of the vomiting."

The jejunostomy may be done for advanced cases of intestinal obstruction of any type by using simple technic. A relatively high left rectus for drainage through a large sized catheter is introduced into the jejunum and fastened in position by a double purse string suture. The catheter comes away after a few days and the opening in the bowel and the abdominal wall soon closes.

If in the search for the obstruction the small bowel is found much distended it can always be proved that the coils farthest away from the obstruction are heavy and contain much fluid, that those nearest the obstruction are light and contain mostly gas.

The heavy coils should be opened in several places to evacuate their contents, and it is sometimes very wise to fasten the drainage catheter by an invaginating technic into the highest opening made for relief of the distended gut. The other openings are of course closed.

A few points of clinical value have been materialized by workers in the laboratory on the lethal agent in the condition, as to its formation and clinical nature.

Whipple and others have shown that the formation of a closed loop of the upper intestine, by double section, infolding the cut ends of the isolated segments after thorough washing and re-establishing continuity of the remaining intestine by anastomosis is equivalent to a simple obstruction. An animal upon which such an operation has been performed dies in a manner typical of obstruction and in the loop there accumulates a fluid which on intravenous injection into a second animal leads to similar symptoms. The poisons may be developed in the absence of all foods, bile, pancreatic and gastric juices and in the absence of a secretion peculiar to any portion of the intestine. The ultimate source must be the mucosa and its products or the bacteria.

Consideration of the chemical content of these indicates that the only known toxic agent which might be formed by their lysis from the protein decomposition products and the combined action of bacteria is histamine, which Whipple has isolated. This on injection into another animal produces symptoms identical to acute ileus. The same toxic fluids introduced into the normal intestine, however, are quite innocuous and must be either rejected by the mucosa or destroyed before reaching the systemic circulation.

Closed loops of the duodenum are usually fatal in from one to two days, of the upper jejunum in from two to four days, and of the lower jejunum in three or more days, while loops of the ileum and colon are entirely compatible with life.

The contents of a closed loop at any level are typically poisonous. So that the difference at the levels lies in the absorption of the poison. The duodenum is particularly vulnerable, for a slight distention

at any point suffices to compress the duodenal blood vessels which follow the mesenteric margin against the serosa and lead to a rapid degeneration of the mass of the loop mucosa. The more rapid fatality of the higher obstructions would thus be correlated with the greater secretion of the upper portions of intestine and consequent early distention, anemia and necrosis of the mucosa.

The evidence is thus clear that death in acute ileus results from systemic poisoning by histamine and other putrefactive products formed in the lumen of the obstructed bowel by bacteria and passed through the mucosa when the latter has become asphyxiated and lost its vital powers of selection, subsequent to distention and interference with its normal circulation.

McQuarrie and Whipple have shown that obstruction is attended by depressed functioning of the kidney due to a direct action obstructive poison. This may be ameliorated by treatment with large amounts of fluids as saline, by hypodermoclysis, which is doubly eliminating the poisons. Another method is by gastric lavage, repeated often, possibly with astringent solutions. In intestinal drainage, the drainage tube must be sufficiently stout to resist compression by the abdominal muscles, a point often neglected with fatal results.

Following the injection of sufficient quantities of histamine an animal passes into severe and fatal shock. Dale has shown that a normal cat will resist intravenous injection of more than 10 mg. per kilogram. Etherization for two hours lowers the resistance so that more than half an hour later 1 to 2 mg. of histamine or less proves fatal. Nitrous oxid and oxygen anesthesia does not lower the resistance. Since in acute intestinal obstruction the body is continually receiving histamine and allied substances ether is absolutely to be avoided. The resection should be performed under nitrous oxid or local anesthesia if possible. Otherwise drainage should be established and the more elaborate operation of searching for and correcting the cause of the obstruction deferred until every means of combating the toxemia has been exhausted and the toxemia reduced. The administration of lactose after the establishment of drainage and the avoidance of protein diet may therefore prove valuable in reducing toxemia prior to the actual removal of the obstruction.

CONCLUSIONS

(1) Since the mortality is in direct ratio to the time between the onset of symptoms and operation, early operation is to be urged.

(2) Each late case is a problem unto itself and calls for that greatest accomplishment of all surgeons, surgical judgment.

(3) The anesthetic should be nitrous oxid and oxygen or local anesthesia.

(4) The toxemia should be combated and neutralized by fluids in abundance, hypodermoclysis, gastric lavage, etc.

(5) Administration of carbohydrates and avoidance of proteins is advisable.

DISCUSSION

Dr. E. T. Newsom, Sheffield, Ala.—It has come to be a general axiom that purgatives should be withheld from acute abdominal conditions until an accurate diagnosis has been made. It is just as important in these cases to keep your hand off the hypodermic and not give the patient any narcotic, even after the diagnosis is made, but take him to the hospital for immediate radical treatment. Narcotics administered in such conditions serve to give a false sense of security to the patient, and by allaying the fears of members of his immediate family, co-operation from them towards doing the right thing promptly is delayed. Thus during the narcotized period the golden hours so valuable for doing something life-saving slip away.

Dr. J. Wesley Long, Greensboro, N. C.—Dr. Holmes reiterated the necessity of early operation. The man who hesitates loses his patient. I know of no class of cases that demands more ability on the part of the surgeon to make up his mind and dare to do what he thinks should be done, than those of acute intestinal obstruction.

Dr. W. B. Burns, Memphis, Tenn.—I am reminded of a case seen recently. A boy said he was sitting on a munition wagon somewhere in France when a shell hit near by and did not hit

him, but knocked him off his wagon. He was operated upon shortly afterward at the front for a gangrenous appendix. Not long after that a cholecystectomy was performed upon him at Brest, and still later a gastro-enterostomy in Birmingham, Ala. I saw him this summer with an acute obstruction. I do not know how many attacks he has had. It was an obstruction that would disappear after a time, being due to constriction at the head of the cecum, at the hepatic flexure and possibly elsewhere. I did not use a hypodermic. He had been operated upon so many times that I think even our learned Chairman would hesitate to rush him to the hospital and operate. Post-operative cases of obstruction require considerable thought and the skill of wide experience on the part of the surgeon before he opens again.

Dr. Robert L. Sanders, Memphis, Tenn.—Within the past six or seven months we have had four unusual types of obstruction which it may not be amiss to mention here. Two of them I had never seen before and was not able to find much upon in the literature. One case was a little girl of ten with a seventy-two-hour obstruction caused by a large hair ball just proximal to the ileo-cecal valve. We thought it was impossible for such a large ball to escape through the pylorus and get down as far as that without producing obstruction earlier. When the ball was removed, it looked just like a musk rat. The girl was *in extremis* when she came into the hospital and was operated on as an emergency. She died in about eight hours following the operation.

The second case was an ileal intussusception. This type of intussusception is fairly common in children, but our case occurred in a man 45 years old. He had a lymphosarcoma of the ileum about eighteen inches proximal to the junction and about thirty inches of the intestine was involved in the intussusception. It is unusual to see this ileal type i.. an adult, making resection necessary.

The third case was a hernia. An odd feature of the case was that the physician at home had reduced the strangulation, but the man was still sick. He was vomiting, his temperature was still going up, and he could not account for it. We thought it was wise to do an exploratory laparotomy and this showed that the hernia had been reduced, but the internal peritoneal band was still holding at the internal ring, making the obstruction complete. The operation relieved him promptly.

The fourth case was a strangulated femoral hernia which made abdominal section necessary. The discolored intestine was reduced first because resection could not be done safely through the femoral opening.

EYE, EAR, NOSE AND THROAT

TUBERCULOSIS OF THE LARYNX*

By H. H. Briggs, M.A., M.D.,
Asheville, N. C.

It is generally conceded that tuberculosis of the larynx, except in rare instances, is secondary to pulmonary tuberculosis. The writer has never observed a case of the former unassociated with the latter. We shall not attempt to discuss the academic question of the modes of infection, whether endogenous or exogenous, leaving this to better qualified investigators, but shall give our attention first to the incidence and relative frequency of the disease. Reliable data as to the frequency of laryngeal tuberculosis is found in the report of the Iowa State Sanatorium for Tuberculosis for the year ending July 1, 1919 (John B. Gregg, *Ann. Otol., Rhin. and Laryn.*, December, 1921). Of 2347 cases of pulmonary tuberculosis observed over a period of one year, 596, or 25 per cent, showed laryngeal involvement. Of this total number of pulmonary cases a group of 1725 were specially studied, which showed 474 cases, or 27 per cent, of laryngeal involvement. Of these, the 322 incipient cases showed 10 per cent laryngeal involvement, the 722 cases of moderately advanced pulmonary tuberculosis showed 21 per cent laryngeal involvement, and 693 cases of advanced pulmonary tuberculosis showed 42 per cent laryngeal involvement.

Of the 122 cases of laryngeal tuberculosis, the pulmonary involvement was incipient in 3, moderately advanced in 31, and far advanced in 88 cases. In the moderately advanced cases the larynx process was arrested in 16 per cent, improved in 48 per cent, and unimproved in 33 per cent. It is also of note that among these moderately advanced cases the larynx improved while the lungs remained unimproved in 22 per cent, and the larynx remained unimproved while the lungs improved in 13 per cent of the cases. In the advanced cases the larynx was arrested in 18 per cent, improved in 17 per cent and unimproved in 64 per cent of the cases. The larynx improved while the lungs remained unimproved in 6 per cent, and the larynx remained unimproved while the lungs improved in 2 per cent.

Among another group of 610 pulmonary cases specially studied were 122, or 20 per cent, with laryngeal tuberculosis, males and females being affected in about equal ratio. Of the 122 cases of laryngeal involvement, 9 per cent were between 10 and 20 years of age, 38 per cent between 21 and 30 years, 33 per cent between 31 and 40 years, 15 per cent between 41 and 50 years, and 5 per cent between 51 and 60 years of age.

The percentage of cases showing unimproved larynges was highest between the ages of 40 and 50, namely, 72 per cent. All the other decades together showed 55 per cent. Improvement in the laryngeal condition of the incipient tuberculous cases was twice as high (64 per cent) as in the cases of moderate involvement and those of the latter twice as high as in the cases of advanced tuberculosis. These figures indicate that the prognosis of the laryngeal condition varied directly with the pulmonary involvement.

The mortality shown in the first year of incipient pulmonary tuberculosis is three times (25 per cent) as great as that found in the same type without laryngeal involvement (8 per cent). In moderately advanced cases with laryngeal involvement it was twice as great (17 per cent) as in the same class without laryngeal involvement (10 per cent). In the far advanced cases it was in the ratio of 45 to 33, respectively. From this one might infer that the laryngeal condition varied with the general condition.

In cases of unimpaired digestion there were 47 per cent of unimproved laryngeal conditions against 73 per cent with impaired digestion.

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*Chairman's Address, Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Intestinal tuberculosis complicating laryngo-pulmonary tuberculosis showed 74 per cent mortality and unimprovement in the laryngeal condition in 84 per cent during one year's observation.

Involvement of the epiglottis or extensive involvement of the larynx indicated a poor prognosis both as regards life and improving the laryngeal condition.

Eighty-seven per cent of the cases of laryngeal tuberculosis showed tubercle bacilli and hemoptysis occurred in 36 per cent, the patient often dating this laryngeal trouble to the time of the hemorrhage.

Of 379 deaths from pulmonary tuberculosis in the institution during five years, 43 per cent showed laryngeal lesions.

Fetterolf reported 83 per cent of laryngeal tuberculosis in 100 autopsies on pulmonary cases.

Pregnancy is one of the most dangerous complications of pulmonary tuberculosis and adds enormously to the patient's chances of death.

SYMPTOMS

It is unfortunate, indeed, that there are no distinctly pathognomonic symptoms in the incipient stages of tuberculosis of the larynx. They do not at first differ materially from that of a simple chronic laryngitis. Slight tickling in the throat, occasionally that of dryness accompanied by a huskiness, is the usual course. These symptoms may subside never to return again if the patient's general condition improves, but there are usually exacerbations with slight improvement and again recurrences when the huskiness develops into a decided hoarseness, soon becoming an aphonia, especially if the lesion is in the cords or in the posterior commissure. Occasionally there is a history of the patient's having lost his voice for a few weeks at a time at intervals of several months only to regain it. This condition may be due to a paresis of the recurrent laryngeal nerve caused by pressure of the tuberculous bronchial glands, the larynx itself being not involved. Increased expectoration due to hypersecretion in the larynx is often noticed.

Dysphagia.—Dysphagia is a most constant symptom in the advanced cases, but may or may not occur in the early stages, depending somewhat upon the location of the lesion and considerably upon the nervous temperament of the patient, the larynges of some patients being far more sensitive than those of others. It is a symptom in at least half of the cases involved. The early infiltration and necrosis of the tip of the epiglottis causes great pain, far more than results after a considerable portion of the epiglottis has necrosed away. Involvement of the cords, ventricular bands and posterior commissure is as a rule accompanied by a lesser degree of pain. In the early stages, however, Doretsky has found dysphagia in only 2.3 per cent, dysphonia in 1.5 per cent, and aphonia in 3.5 per cent. Consequently, these symptoms should not be depended upon in early involvement.

Stridor is manifest at the onset of stenosis, which may be caused by edema, granulomata or tuberculomata.

EXAMINATION OF MOUTH, NOSE, AND PHARYNX

Before attempting an examination of the larynx, it is well to examine carefully the teeth, gums, fauces and tonsils, noting whether the tonsil crypts are diseased and filled with cheesy debris; whether the pillars are adherent and obstruct the crypts; whether there is foreign material in the supra-tonsillar space or behind the anterior pillars, and the amount of lymphoid tissue in the pharynx and naso-pharynx. A post-rhinoscopic view may reveal the remains of adenoids and retained secretion in the epipharynx. Examine each nostril for secretion, for spurs, deviations of the septum, or other obstructions. Transilluminate the sinuses and determine whether they are furnishing infectious secretion which may irritate the larynx and predispose to its infection. Determine whether each nostril is patent and whether the patient is a nose or mouth breather. It is very essential that cases of laryngeal tuberculosis have normal breathing space through the nose and that the function of the nose to warm, moisten and filter the air be unimpaired.

EXAMINATION OF LARYNX

Examination of the larynx should be so arranged as to cause the least possible discomfort both to patient and examiner and if possible should be made in the patient's usual environment. Only in early involvement and if the patient's general condition is good should he be subjected to the fatigue of an examination at the doctor's office. The sanatorium should be provided with a dark throat room where all patients who are able may be taken comfortably for a thorough laryngological examination at regular intervals, but the really sick patient should be examined in his own bed with the least possible fatigue and excitement. The room should be darkened and a brilliant light placed in a steady position back of the patient for reflection into the larynx. A towel for holding the tongue, a tongue depressor, laryngeal mirrors and hot water for emersing the latter should be at hand. It is quite necessary to get the patient's confidence; that he be told that you will not hurt him, and that he can materially aid in the examination by his cooperation. Instruct him how to relax not only the tongue and throat, but also the entire body, and how to breathe through the mouth during the examination. Tell him to sing A in a low tone and to follow your phonation of the same vowel through different pitches. Let him attempt it even though he may be aphonic. Teach him all this before attempting laryngoscopy, and if you succeed you will usually be repaid by a splendid view of the entire larynx. Occasionally slight local anesthesia of the pharynx becomes necessary to a thorough examination. Note first the epiglottis, then the arytenoids. Look carefully into the posterior commissure and at the posterior ends of the cords where the early lesions usually begin. Compare the color and tension of the cords and of the ventricular bands. Note any asymmetry of the two sides which might indicate a beginning infiltration; any lagging of arytenoid or cord during the act of phonation, and whether one cord tends to overlap the other. Note any nodules and whether any injection of either cord ensues during the examination.

DIAGNOSIS

(At this point the pathology was illustrated with lantern slides and discussed verbally by the author.)

PROGNOSIS

The most reliable data for the prognosis of laryngeal tuberculosis were found in the report of the Kings College Hospital, Midhurst, England, covering the four years between June 30, 1911, and June 30, 1915, the after histories being followed for three years after the patient left the sanatorium, which made seven years in all. The total number of laryngopulmonary tuberculosis cases was 883. The system of grouping was that known as the Turban Gerhardt method used in England.

TABLE 1. PULMONARY TUBERCULOSIS WITHOUT LARYNGEAL INVOLVEMENT.

	Males				Females				Both Sexes			
Group	A	B	C	D	A	B	C	D	A	B	C	D
1	109	19	1	17.4	71	9	2	12.7	180	28	3	15.6
2	236	95	5	40.3	109	36	1	33.0	345	131	6	38.0
3	85	61		71.8	77	53		68.8	162	114		70.4
Total	430	175	6	40.7	257	98	3	38.1	687	273	9	39.7

Note: A—No. cases. B—Dead from tuberculosis. C—Dead from other causes. D—Per cent of deaths from tuberculosis.

TABLE 2. PULMONARY TUBERCULOSIS WITH LARYNGEAL INVOLVEMENT.

	Males			Females			Both Sexes		
Group	E	F	G	E	F	G	E	F	G
1	11	5	45.5	3	1	33.3	14	6	42.9
2	53	38	71.7	37	19	51.4	90	57	63.3
3	54	43	79.6	38	29	76.3	92	72	78.3
Total	118	86	72.9	79	49	62.8	196	135	68.9

Note: E—No. cases. F—Dead from tuberculosis. G—Per cent of deaths from tuberculosis.

Group 1: Slight cases; disease limited to a small area of one or both apexes. Group 2: More extensive than Group 1, the whole of one lobe, or severe disease extending to half of one lobe. Group 3: More severe than Group 2, including the cavity cases. From this data Sir Sinclair Thompson (the *Lancet*, October 18, 1919, page 87) made the following observations. Table 1: The mortality was greater the higher the group. In Group 3, 70 per cent were dead in 7 years. In the three groups combined, males and females, 39.7 per cent died in 7 years. In comparing the non-laryngeal, Table 1 cases, with the laryngeal Table 2 cases, including both sexes in each, the mortality in Group 1 was 15.6 per cent against 42.9 per cent; in Group 2, 38 per cent against 63.3 per cent; in Group 3, 70.4 per cent against 78.3 per cent; and a total of 37 per cent against 68.9 per cent. Quoting Sir Sinclair Thompson:

"In other words, among all cases of pulmonary tuberculosis 60 per cent of them may be alive in 3 to 7 years, while only 30 per cent of those complicated with laryngeal tuberculosis may be alive at the end of the same period."

Every case of laryngeal involvement, in fact, every case of suspected pulmonary tuberculosis, should have a serological examination as an aid in excluding lues. The possibility of cancer, papilloma, laryngitis sicca, pachyderma laryngis and other conditions should be borne in mind. There is one condition which, twenty years ago, I attempted to call attention to and designated as a pretuberculous laryngitis, which others since have more accurately termed a hyperplasia, involving the interarytenoid space, and false and true cords, which is often the first pathologic change noted and frequently without any associated subjective symptom. It must be remembered that such hyperplasia may result from a nasal stenosis, chronic pharyngitis, accessory sinus disease, bronchitis, syphilis, lung abscess, asthma, etc., and that it simulates very closely that of laryngo-pulmonary tuberculosis.

The prognosis depends upon:

(1) Environment. A very small percentage of cases of laryngo-pulmonary tuberculosis receives the necessary nourishment, air, sunshine, housing, clothing, hygienic instruction, rest, etc., which are necessary to a cure; consequently the high death rate and the popular and professional false impression of an inevitable fatal termination.

(2) General condition of the patient and his resistance. A long family history of fatal cases indicating a probable low familial type of resistance is always discouraging.

(3) The laryngeal lesion, its location and especially its character, being most unfavorable in the acute and less in the subacute and chronic stages.

(4) Treatment. Freudenthal has repeatedly reminded us that laryngeal tuberculosis is curable in any stage. Especially do such means as enjoined silence, heliotherapy and, in selected cases, electro-cautery tremendously favor the prognosis.

(5) The question of prognosis and treatment of laryngo-pulmonary tuberculosis is social as well as therapeutic, and we, as laryngologists, can do more to lower the mortality rate by our contribution to an educational campaign, eliciting the assistance of the community, state and Nation in proper legislation and appropriation than we can with all the therapeutic measures known to the science of laryngology.

Internist.—The patient should have the attention of an internist who may find an obscure concomitant trouble less manifest than the laryngitis or the pulmonary lesion, yet nevertheless as important and possibly more urgent, which may augment the ravages of the disease in question and handicap the recovery. The tuberculosis specialist in private practice or in charge of a sanatorium may not have the time or possibly the technical training for investigating and treating such conditions, yet his conscience will tell him that the poor victim is entitled to all the benefits which modern medical science offers. The modern patient is becoming educated to the point of demanding a thorough examination, thanks to the efficiency of the educational campaigns conducted by some of our state boards of health.

TREATMENT

A well selected regime is just as essential for a case of laryngeal tuberculosis as it is for pulmonary tuberculosis. I cannot lay too much stress on this point, for I have often seen a sad ending of a case of laryngo-pulmonary tuberculosis where, on account of the mild involvement of the lungs, it was not thought necessary for the patient to take the cure strictly. He was allowed to roam around and use his voice *ad libitum*, only to find his mistake too late. So, I wish to urge that the four cardinal essentials in the proper regime in pulmonary tuberculosis, namely, rest, including regulated exercise, nourishment, air and sunshine, are indicated in laryngeal tuberculosis even if the pulmonary signs of infection are seemingly wanting and become doubly imperative if the laryngeal lesion is paramount. To this end it is necessary that he be placed in pleasant surroundings, free, so far as possible, from care and worry, and that he be encouraged to develop a fighting spirit and morale without which few patients ever get well of tuberculosis in any form, stage or clime.

Just here I would like to say a word against routine. Routine to a certain extent is necessary for the management and treatment of tuberculosis, but a too close adherence to a routine that the busy institutions and busy practitioners are almost forced to adopt will result in failure in a certain percentage of possible cures. Last week, in St. Paul, I heard a most interesting discourse on the rational treatment of syphilis, by Dr. Wile, of the University of Michigan. The keynote was individualizing the patient as against the routine treatment. He pointed out the great success which the campaign against syphilis is accomplishing through a necessarily more or less routine treatment, yet regretted the necessary number of failures on account of routine. It is essential to individualize the tuberculous patient, especially with reference to his tastes and temperament, for such patients are more diversified and represent the various strata socially, intellectually and physically more than do the luetics, and in order to establish the proper morale and fighting spirit each case must be individually studied just as a case of mastoiditis, a nephritis or a hyperthyroidism must be studied and treated individually.

Silence.—Rest is recognized in both medicine and surgery as being an essential condition to recovery, and we have observed its efficiency in pneumothorax in immobilizing the lungs. It is equally essential to immobilize an inflamed larynx, but unfortunately it cannot be so effectively done since the larynx is involved either actively or passively in the physiological acts of breathing, coughing, sneezing, swallowing and most of all in phonation. This latter source of motion and disturbance fortunately can be eliminated through silence, and by silence I mean absolute silence indefinitely until cure is effected. If I were asked the relative value of the various measures to relieve and cure laryngeal tuberculosis, I would put silence first, the general regime above mentioned second, surgery (in selected cases) third, heliotherapy fourth, local applications fifth, and internal medication, including tuberculin, sixth.

Pain and Dysphagia.—Pain and dysphagia are the symptoms most to be dreaded, and, unrelieved, mark the beginning of the end. Radical means are therefore justifiable when they appear. Orthoform and anesthesin are somewhat palliative if insufflated on to the lesion by the doctor or by the patient in case he has been properly taught, but in the hands of the average patient they are practically valueless. Cocain or procain are allowable and indicated in small percentages, increased at intervals if necessary, in any case where the dysphagia resisting other treatment prevents the taking of proper nourishment. In order to induce the greatest anesthesia, powders should be insufflated one-half hour and solutions used ten minutes before meals. The use of the electro-cautery is of far greater value in dysphagia than are topical applications. The greatest pain is due to erosion of the mucous membranes containing the sensitive nerve endings. Well placed ignipuncture not only alleviates the pain, but in some way checks the infiltration and

erosive processes and induces resolution, probably by sclerosis.

Of greatest value to the patient and physician is the fact that the superior laryngeal nerves which supply the upper part of the larynx pass upward very superficially over each side of the larynx before penetrating the cryco-hyoid membrane and with a working knowledge of the topography of the parts the nerve may with ease be located, injected or resected, bringing immediate relief from the dysphagia. A gain of 10 pounds in weight in one week after an alcoholic injection of these nerves has been observed.

Stenosis.—Beginning stenosis of the larynx evidenced by stridor is a sequela of laryngeal tuberculosis which demands immediate surgical interference. The stridor is greatest on inspiration in contradistinction to tracheal or bronchial stenosis where it is usually greatest on expiration, and the patient is wont to assume the sitting posture with head drawn slightly backward in laryngeal stenosis. With stenosis farther down he assumes the position of the chest and body bent forward and chin downward. The stenosis may be due to exuberant granulation or cicatricial bands, or it may be due to tuberculoma. The laryngoscopic examination quickly determines whether the stridor is due to obstruction or to bilateral abductor paralysis from pressure on the recurring laryngeal within the chest or from bulbar lesions which may occur in locomotor ataxia. Occasionally a stenosis can be relieved by gradual dilatation of the larynx, but usually tracheotomy must be resorted to.

Aside from the treatment of the symptoms above given there are indicated measures for cleansing the larynx and removing the acrid secretions. An alkaline gargle will do this far better than will a spray from an atomizer which, in the patient's hands, seldom reaches the parts affected.

While I seldom prescribe iodoform to be used in a powder blower by the patient, I do think that in certain cases where the patient can be taught its proper use and in cases whose digestion and olfactories can withstand the onslaught, it may have a limited efficiency. Dr. C. L. Minor, of Asheville, is very strong in its praises. Chaulmoogra oil in intra-tracheal insufflation is mentioned favorably by a few. I have not used it.

Cantharides blisters on the sides of the larynx over the superior laryngeal nerves are sometimes moderately efficacious in relieving dysphagia.

Continued daily local applications varying in strength to the affected parts are frequently administered in certain stages of the disease with benefit providing the operator is very careful that the tip of the applicator is well covered with cotton and no undue force is used that might in the slightest degree abrade the mucous surface. I feel quite sure that damage is often done to the larynx and the tuberculous process is extended by the injudicious and meddlesome use of topical applications. The strength of the solution should depend mainly upon the stage of the disease, increasing as the chronicity advances. There is contraindication for applications in the acute or per-acute stages of laryngeal tuberculosis. On the other hand, a chronic ulcer may tolerate with benefit a strong solution. Of greater value than topical applications I have found intra-laryngeal injections of a bland oil containing from 0.5-2.0 per cent of menthol and twice this percentage of eucalyptol and guiacol, but care must be taken that the syringe tip in delivering the solution does no harm. The patient's tongue should be held forward and he should be instructed to take a deep forcible inhalation when the syringe propels the solution deeply into the larynx. The tip of the syringe should be pointing directly downward and just beyond the upper margin of the epiglottis, which it should not touch.

Surgery. — Of perhaps the greatest value is the surgical treatment with the electro-cautery in properly selected cases. In some instances the epiglottis may first be removed by cutting forceps and afterwards cauterized. Increasing infiltrations are immediately benefited by ignipuncture carefully placed at two or three points at intervals. By the use of the cautery deep ulcerations throw off effete tissue and a new resistance is induced.

I shall feel very grateful indeed if I have been successful in convincing my hearers: (1) of the vast prevalence of laryngeal tuberculosis complicating pulmonary tuberculosis; (2) of the increase in mortality which this complication adds; (3) that this complication adds to an otherwise painless disease, pain and discomfort which is equaled in but few other diseases; (4) that there is a rational treatment for each stage of laryngeal tuberculosis, that a cure in any stage may be possible, and that there are effective measures for the relief of pain; (5) that an especially skilled laryngologist should be in attendance in every tuberculous sanatorium and that the pulmonary tuberculous specialist should either have associated with him such a laryngologist or perfect himself sufficiently both medically and surgically in the technic of laryngology to enable him to give these poor victims the aid which the science of laryngology offers.

DISCUSSION

Dr. Charles L. Minor, Asheville, N. C.—This subject is too big to discuss thoroughly, and I shall dwell upon only a few points.

The throat men get their cases much later than the lung specialist does. They do not often have a chance to see an extremely incipient case. If a lung man like myself is familiar with the laryngoscope and examines every patient in whom he finds pulmonary trouble, he will see many extremely incipient cases.

If you wish real results, diagnosis must be made of the early changes. If you do not see the cases until later I think you are justified in your pessimism regarding laryngeal tuberculosis.

Treatment varies greatly if a case is incipient or advanced, if it is an infiltration or an ulcerated case, and according to the different types of pathologic lesions which exist. But unquestionably in all cases cleanliness is highly desirable. You know well how dirty an advanced larynx case is from being bathed with the secretions. I believe therefore that the proper use of simple alkaline washes in all cases, of an astringent solution in congested cases and of a mentholated spray is valuable.

To make a hard and fast rule that silence applies in every case of laryngeal tuberculosis is a mistake. A case where there is involvement of the cords or the posterior commissure absolutely demands silence. It is extremely important. Where it involves the epiglottis we have not found silence necessary. Certainly the mental effect upon the patient of absolute silence, except in so far as it cultivates his will power, is bad. But unquestionably a large number of these cases under silence and cleanliness alone will do well.

Local applications vary with the case. I am satisfied that the local application of iodoform is of great value in beginning infiltration. Iodoform in the presence of living cells gives off nascent iodin. The patient has iodoform insufflated into the larynx before breakfast and at bedtime. Some cannot take it, but a large majority can take it easily. It is perfectly marvelous in those cases how the infiltration will disappear under its systematic use. I have seen large infiltrations gradually absorbed. If I have ulceration I do not use it. In such cases I like lactic acid and glycerin. My personal experience for a number of years has convinced me that small, not too active ulcerations do well with careful, not violent, strictly localized applications of lactic acid and glycerin, or formaldehyde and glycerin.

As far as dysphagia is concerned, alcohol injections, when they work, are valuable, but they do not work sufficiently often to give satisfaction. I heard from Dr. McBrayer the other day that he had been experimenting with the effects of the x-ray in dysphagia. He had a case of enlarged glands of the throat which he subjected to the x-ray and it relieved the dysphagia. He has tried it in other cases since and found it useful. I have had no experience at all with it, but I think it ought to be mentioned here and tried out.

It is a pity to let the public have such a terrible idea of the hopelessness of laryngeal tuberculosis. We get good results if the cases are found reasonably early, and if the patients give proper cooperation. My patients, of course, are under proper hygienic conditions, but in other places this cannot be so well managed. You have not the opportunity to govern your patients that I have, but I believe we can face an ordinary case of laryngeal tuberculosis, not too advanced, with a good deal of hope, and we sometimes see very bad cases in which either through surgery (which I do not favor as I used to) or by other means can also be brought to a standstill. The final need is to find them early and then give a rational and not too interfering treatment.

GROUP MEDICINE

GROUP MEDICINE: A PROCESS OF EVOLUTION*

By R. B. McBride, M.D.,
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Medicine, an art, is fast becoming a science. Indefatigable workers have devoted themselves to special tasks and thereby truths have been established that may be employed by any learned physician without fear of contradiction. Definite values are given to signs, symptoms and tests that bespeak specific therapy for the sick individual instead of empirical methods that may be a thousand years old. This means relief for the patient and satisfaction for the physician. Such rapid strides have been made that there is no disease today which physician and laity do not look forward to controlling, and even of finding specific therapy for. Preventive or prophylactic medicine, unheard of a few decades ago, is now prominently taught in our medical schools, practiced by every honest physician and sought more and more by the laity as the months go by.

This status of medicine is of recent years and has been brought about by specialization. Men have trained under men who have devoted themselves to some one phase of medicine and they themselves have spent their lives at the same tasks, working out truths and facts, or laying the foundation for those who took up their work. These men are called specialists, and as one particular branch of medicine unfolded its problems and possibilities, workers would narrow their domain until, today, the special fields of medicine are very numerous. This is one phase of what we refer to as the evolution of medicine. The general practitioner of yesterday, from whom the specialist of today developed, had his beginning in men who, though without means of training, were willing to work with meager facilities to alleviate as much as possible human suffering and ills. Thus from folklore, medicine developed into modern science.

That specialization has been the cause of the great advance in medicine, and that it has come to stay all will admit. Barker, May, 1921, wrote:

> "On the whole, the advances made in clinical science by means of specialization have been astounding. That there will be cessation of this tendency to specialization seems unlikely. On the contrary, the differentiation of workers will in the future in my opinion be even greater, for men have found that mastery comes through limitation of field and concentration of interest and effort. Coincident, however, with this increasing division of labor, provision must be made for the synthesis of results of the special workers into harmonious wholes."

This last thought, to my mind, bespeaks the next, and to date the last link in the evolution of medicine, group medicine, or group practice.

Whether we admit it or not, practically all of us are today practicing group medicine. The general practitioner sends his patients to the different specialists for special information in their field of work; to the laboratory for serological and bacteriological examinations; to the x-ray man, to the eye, ear, nose and throat specialist, to the cystoscopist, etc. The surgeon needs the help of the internist and of the laboratories, and vice versa. The specialist in every line needs the help of those about him skilled in other branches of medicine, for no organ of the body gets sick by itself. I recall that recently a very prominent specialist in diseases of the eye told me that he needed the services of the internist in 90 per cent of the cases coming to him, adding that when the internist was not available he had to be internist and eye man, too, and he had never practiced or studied general medicine after his college days. It is too often true that the specialist consulted finds and treats a minor affection in his field, when the patient is suffering from some far more important disease, which may be overlooked altogether by him. A well known surgeon told me recently that as he

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examined his patients more carefully, or had them examined by an internist associated with him, that he was really surprised by the number of patients that were being relieved by removal of focal infection, rest, proper diet, etc., who heretofore had been operated upon. It is not altogether the fault of the specialist that such a condition exists. An x-ray man treats with radium or x-ray a bleeding fibroid, getting relief for a patient, who recommends a friend with an apparently similar condition. The friend may have a fibroid and also virulent pus tubes that are not readily apparent, in which case x-ray or radium might be disastrous. Many such examples could be given where the specialist fails to obtain proper cooperation from those about him, possibly for fear the patient may lose confidence in him, or resent the extra time, inconvenience and money that it takes to obtain an examination and consultation of the many specialists that may be needed in the case.

That physicians and the public fully realize the need of cooperation and consultation by several competent specialists when there is a difficult medical situation in hand is demonstrated by the facts that:

(1) Independent physicians recognize the necessity of cooperating with those about them.

(2) Large industrial plants and the armies of the world specialize and coordinate their medical men.

(3) Hospitals and medical schools have for some time developed specialization and cooperation among their staff.

This latter probably was the first evidence of group medicine, and for the poor who receive the benefits of clinics thus arranged, medicine has become complete and ideal. The public, however, that is not served by industrial medicine and free clinics, has learned that it is not receiving the best there is, and in lieu of a proper place to go is taking itself first to one specialist and then to another who may be recommended by a friend.

Often they find themselves in the hands of a specialist who does not see beyond his special field. Weeks and months, and per chance health, may be lost before the patient finds himself under the care of a physician who can give the best service for his particular disease. If one doubts that such happens we would ask him to recall the number of cases of pyelitis that have been operated upon for appendicitis, the number of upper abdominal operations that have been performed where the pains and distress were cardiac in origin. I have known of two abdomens being opened recently by good surgeons for conditions that later proved to be gastric crises of tabes dorsalis. I know of a man who was treated for tuberculosis for a year and had a supposedly tuberculous testicle removed, who today is robust and doing strenuous work after it was determined that he was luetic and proper treatment instituted. No matter how closely we examine and cooperate with those about us, mistakes will be made, but they will be considerably less numerous if we use all the talent to be had in an organized and competent group, whether it be private or institutional. If a specialist does determine that another physician should see his patient, often the patient resents being passed around and paying separate fees. He dislikes also the inconvenience of going from building to building if that be necessary, and the time consumed. This situation is conducive to the development of cults and charlatans. To illustrate the public's point of view, I quote from an abstract of one of our large and substantial daily papers:

"The public does not know how to get sick as a specialty. Instead, the public just gets sick. If it could acquire that art, a sick man might know whether to consult an x-ray man, a rhinologist, a dermatologist, oculist, aurist or one of three or four different kinds of dentists. The general practitioner is rapidly going out of date as a species. When a man gets sick now he has to employ somebody to tell him whom to employ in order to find what specialist to consult for what ails him. Perhaps he is better off than in the old days when he sat for a few minutes in the dingy office up over a drug store and smelled whiffs of formaldehyde, ether and castor oil until a bearded old gentleman came out and prescribed a poultice and tincture of iodin to be painted somewhere or other on the skin. But the new way is more bewildering—and immeasurably more expensive.

"If a car owner had to do as a sick man has to do now he'd never get his car repaired."

Numerous editorials such as the above appearing from time to time in our large

daily papers bear witness to the fact that the public realizes there is lack of coordination of the many specialties of medicine.

Group medicine, or group practice, to my mind, is the solution of the problem from the standpoint of both patient and physician. When it is known that there is a group of competent and conscientious specialists housed under one roof, patients will quickly realize that all they need to do is to apply to such an institution, and if they themselves do not know the kind of specialist they need they will shortly be placed in proper hands. If it is necessary to be seen by several physicians, there will be a great saving in time for both the patient and the doctor. It need not be said that individual contact with the doctor desired is lost to the patient when visiting these clinics, for the one consulted can ascertain the field involved and refer the patient to the proper specialists, keeping in close touch with him all the way and entering into the consultation when all information concerning the patient is assembled. Too much has been said about individual service and individual contact of the doctor with his patient. It is well and good if it happens to be the kind of specialist that the particular patient needs. If he is not, both patient and doctor had best sacrifice their feelings and desires to have the case carefully and skillfully handled. The time has passed when men can cover the whole field of medicine and it is passing when patients will allow the physician to diagnose and treat without the employment of all modern methods of investigation at hand.

In a well organized clinic complete records can be kept, so that at any time any physician in contact with the case may not be in doubt or find it necessary to repeat tests that have been made. Also facilities that would be next to impossible for one or two men to own may be at hand for the use of the group. Consultations can be easily arranged, and not least, from the standpoint of the patient, there will be one fee which shall cover a proper charge at the hands of each specialist. Necessary accessory examinations such as laboratory work, x-ray work, etc., should be charged for at a rate only slightly in excess of the actual expense. It is not proper, and the public will not stand always for large fees at the hands of men for these services. They should have the use of them, for they are entitled to every means at our command for thorough diagnosis and treatment. It is very unjust to deny a patient any examination or test that will assist in the diagnosis and treatment of his case, and as unfair to charge him a large fee for each and every service, as to charge him an extra fee for the use of a stethoscope, blood pressure determination, or the taking of temperature. To withhold from our patients all the facilities for diagnosis and treatment that have been developed in the medical profession means inefficient methods of practice. To persist in inefficient methods of medical practice is to discount much of the importance of the great advances in the medical sciences already accomplished as well as those to come. To deny the public the full benefit of these advances is to invite degrading and destructive legislation which may ruin the profession here as it has ruined it in Germany and is now ruining it in England.

Discussion follows paper of Dr. Vaughan, page 728.

GROUP MEDICINE: A CRITICAL SURVEY*

By Warren T. Vaughan, M.D.,
Richmond, Va.

Group medicine in its present form has been evolved chiefly by those specialists in the various branches of medicine who have recognized their own limitations and the consequent possibility of error in diagnosis and treatment, and by men who have been dissatisfied with the existing procedures of individual consultation. But many of the combines of physicians today masquerading under the title of group practice are not true groups. Several independent physicians often have offices

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together so that each may readily consult with the others concerning his own private patients. They are not practicing group medicine. Arrangements for sending patients from one specialist to another for various examinations, while entirely laudable if not commercialized, does not constitute group medicine.

THE ELEMENTS OF A GROUP

The group is an integral institution in which each member bears his share of the responsibility in both diagnosis and treatment. In the true group, the patient is equally under the care of all the members in whose special field he or she presents pathology. The chief distinction, however, between true group medicine and the loose organizations above referred to is the incorporation within the group of the "integrator" system, so well described by Barker. The primary aim of group practice is service, particularly to the patient and to his family physician. No group which does not cooperate to its fullest ability with the practicing physician, both while the patient is under observation and after his return to his own doctor, will be truly successful.

Two facts are today operating to give group medicine an unfavorable reputation. First, some so-called groups have commercialized their work to an extreme degree. The patient is run through the mill, or, as he himself states, he is "put through the group system;" a diagnosis is ground out; the patient is charged a not insignificant fee; and is sent on his way with a new diagnosis and little or no treatment, with voluminous but inconsequential reports and recommendations to the family physician. He has paid his fee for a new name and on his return home the same old treatment continues. Diagnosis without proper treatment based upon the findings is of little practical value to the patient. In these organizations one finds more group than medicine.

The second factor operating against the reputation of group medicine lies in the combining of insufficiently trained men, usually in small town hospitals, who import incompetent technical assistance particularly in the pathological laboratory and in the x-ray department. If the various fields of medicine are not covered, usually one or more of the members takes a two or three months' course in the fields not covered, such as cystoscopic work and electrocardiography, and thereafter considers himself proficient in these fields. The work of such "groups" is necessarily unsatisfactory and errors are frequently made. The unfortunate patient thereafter criticizes group medicine in any form.

In short, just as we find skilled and unskilled physicians and surgeons, we find today scattered through the country efficient, capable groups and inefficient, untrained groups. Just as it has been necessary in the past to know the qualifications of the man who is to be called in for consultation, it now becomes necessary to recognize the qualifications of the group and to choose that one which is doing the best work. The selection becomes more difficult because one is dealing with several individuals instead of one. One inefficient man may vitiate the value of the entire group. No chain is stronger than its weakest link. Errors of examination or interpretation in any one field may negative the value of all the remaining findings. Dependence on the reports of a partially trained subordinate has caused error in some of the best known groups. This is exemplified in such a simple procedure as the routine history and physical examination. Too often this is left almost entirely to the interne. The internist contents himself with auscultation of the heart and lungs and palpation of the abdomen. This procedure impresses the patient with the fact that he has been examined by the head internist, but often adds little to the examination. In some groups, after this cursory examination, the integrator sees no more of the patient until all the records are in, when he, depending almost entirely upon the findings of others, informs the patient of the conclusions, discusses treatment in a general way, shakes hands and bows him out. This is the swivel-chair method of group practice.

Again, it is imperative for proper functioning of the group that organization

and administration be not dominated by one individual. It is a rare group in which all members are of equal prominence and personality. Usually either the surgeon or the internist, less frequently one of the other specialists, has developed a wider reputation than the others. Not infrequently, in fact, the group has been organized by such a man around himself as the nucleus. Such a man is not infrequently one who has accomplished what he has by hard work and fighting, and who has thereby developed a dominating, and sometimes intolerant attitude. When, however, such a man is sufficiently broad and liberal to subverse his own ideas to the best interests of the group as a whole, the group will work satisfactorily. The successful internist or surgeon will either associate with himself men whom he believes to be as competent in their fields as himself in his, and thereby build the strongest type of group, or, if controlled by a desire to dominate, he will surround himself with relative incompetents, thus destroying from the outset the possibility of developing a successful cooperative group.

As far as work within the group is concerned, team work is indispensable. There must be no friction, and all must cooperate at all times for the best interests of the patient. Petty rivalries and jealousies are as out of place in the partnership of a group as they are within the portals of the home.

It is not necessary that every specialty be represented in order that the group function efficiently. Occasionally the local conditions render it advisable to omit certain specialties from the group. Thus, most people have their own dentist whom they would prefer to a strange man associated with the group. Nowadays even ophthalmologists and oto-laryngologists will often fall under the same classification. A group may be built on a basis of a few specialties, but the men in these specialties must recognize their own limitations and unhesitatingly call in consultants for the occasional cases falling in fields not covered within the group.

RELATIONSHIP OF GROUP TO PATIENT

It is not necessary that every patient be studied by every member of the group. This would entail an unnecessary financial burden to the patient and a considerable waste of time for all. It is, however, necessary that each patient be thoroughly studied by every man in whose specialty he evidences pathology. That this may be accomplished it is essential that at the outset he be examined thoroughly by some individual whose specialty is sufficiently comprehensive that he will cover in a general way the patient's entire system. This work naturally falls to the internist. He must be sufficiently trained and possessed of sufficient judgment to recognize the need for more detailed study in particular fields, and must request such studies.

But the internist or integrator must not be content to be a mere director. Some individual must know the patient thoroughly, both physically and psychically, and must sponsor and support him as he is being conducted through the maize of "the group system." It is he above all others who must preserve the personal element which is so often lacking in group practice, and who must immediately become the friend and confidant of the patient. Without this personal contact some even of the best so-called groups have been failures, as far as the patient is concerned. It is not sufficient that the psychiatrist of the group examine him as to mental normalcy. In fully 50 per cent of all invalids, including those with definite somatic disease, there is in addition much to be done in aiding their mental attitude and unless this is recognized and appropriately handled, the "group system" becomes but a factory for grinding out diagnoses, with the attention focussed almost exclusively on the presence or absence of organic pathology. From the nature of their work this intimate personal touch is not as important with the other specialists in the group.

The internist finds it, then, his duty to study the patient's condition in every detail, to reach what diagnostic conclusions he can and to recognize without fail the various indications pointing toward more

detailed studies in special fields. He will then expedite these special examinations, keeping in touch with the individual case at all times. If the results of special examination in one field suggest further examination in yet another, it makes little difference whether the internist or the other specialist requests the additional studies. After the work has been completed the patient's disease status is considered best in consultation of all the members in whose field trouble has been found and appropriate treatment is selected.

Again, it makes little difference who makes the final diagnosis. If the case be found to be surgical, the internist would raise no objection to the surgeon's informing the patient with regard to the diagnosis. The patient is in the care of the group and is under the authority of the internist no more than he is under the care of the other physicians. The question of professional etiquette plays no part in this small matter. But it is true that as a rule there is not a single final diagnosis, but many. Perhaps the average number of diagnoses per individual will be around a half dozen. These should cover all variations from normal found in the individual case. Perhaps only one diagnosis is of immediate importance, but all should be recorded. As a rule, the majority of these diagnoses will be made by the internist. All records should be returned ultimately to him for coordination and for recording the completed diagnoses. His more intimate knowledge of the patient's condition and mode of living may lead him to stress some of the pathologic findings more than others, and will aid him in cases where there may be a choice of methods of therapy.

GROUP THERAPY

I would emphasize that the duty of the group to the patient is but half terminated at the completion of the diagnosis. Group therapy is of as great importance as group diagnosis. I have stated that diagnosis without proper treatment based upon the knowledge acquired is of no value to the patient. From the point of view of the group, especially in those cases where operation is not required, the treatment appears sometimes unsatisfactory in that it is carried out by the family physician and not a group member. Theoretically the man who examines an individual patient the most thoroughly knows the most of the patient's malady, and is the man best qualified to direct the treatment. On the other hand, in most cases the general treatment should quite rightly be left in the hands of the family physician. When the latter is not cooperatively inclined he may neglect or ignore the therapeutic suggestions made. The internist is then helpless.

The further development of group work in and of itself will eliminate to a great extent this disadvantage. If the internist, in his reports to the family physician, describes his findings and recommendations as lucidly and at the same time as briefly as possible and assumes a cooperative attitude, he will receive in return the cooperation which he gives. This is a situation where the personal element enters and each group must work out its own system.

The treatment by the group of invalids under their care also varies with the groups, and at present it is superfluous to try to describe a standardized system for the division of the labor. The one point that I would emphasize particularly is the necessity of avoiding a tendency towards "passing the buck" into which any of us may fall where two or more individuals are treating the same patient. This again is a matter of individual personality and one's sense of responsibility and accountability to the patient and to the other members of the group.

RELATION TO FAMILY PHYSICIAN

Perhaps the greatest present antagonism to group practice is found in the attitude of the occasional family physician. This is not because he disapproves of advances or improvements. There are many good men in this field who welcome whole-heartedly any improvement in medical practice. Where antagonism exists it usually has a foundation in unsatisfactory past experiences. The practicing physician is the patient's personal adviser, and from this intimate contact can be of service in many a way which the group could never accomplish even should it so desire. The alert physician sends his patient to

the group for whatever examinations he is not equipped or qualified to make, and it is the duty of the group to make those examinations and return the information to the physician so that he may the better care for his patient. The group sees the patient for a few days or at most a few weeks; the physician sees him throughout the remainder of his life.

One of the greatest needs of group practice today is the development of a satisfactory system of cooperation with the family physician. In the group which I have helped form this has been worked out apparently to the satisfaction of the physician. Each hospital patient is under the combined care of the various members of the staff. From the moment of a patient's admission, as far as that individual case is concerned, his own physician becomes a functioning member of the group and is kept informed at all times of what is being done, and his opinions and suggestions are welcomed. If the physician lives in the city he visits the patient as frequently as he desires and is given all due facilities. If he lives out of town he is kept informed at frequent intervals by letter. In either case, when the patient leaves the hospital the physician knows what has been done and can competently take up the treatment where it was left off and continue without change and without delay.

CONCLUSIONS

Group practice is a distinct advance in clinical medicine. It is not without its shortcomings and these should be recognized and remedied if possible. Most of the discussions of group practice so far have either been laudatory ones made by members of groups or condemnatory ones by non-members. We have now reached a stage where members of groups, who from their experience are best able to recognize the weak points and shortcomings of the system, should air these disadvantages and attempt to remedy them. Group practice in some form has come to stay. The final form will be far different from the present one. It is the duty of us who are interested in the work to devote our energies to establishing the most satisfactory form.

A specialist in any one line tends to become one-sided. So also group practitioners may become biased in their judgment as to the relative value of the group. At present I am under the impression that perspective would be better retained if each group member had in addition to his group work an entirely disassociated practice in his own field, thereby retaining at the same time the point of view of the individual practitioner. He would divide his time between the two services. The individual practitioner of medicine is not doomed to extinction. The family physician will last and will remain the keystone of medical practice. Probably his development will progress more rapidly from the impetus given by group practice. I anticipate the day when there will be two forms of family physician, one with a minimum medical training of two or three years, who will give to the public a service which is now being usurped by the chiropractors, osteopaths and Abramites; and a second more technically trained individual corresponding more to the present-day internist. These two types of physician will work in cooperation, both with each other, and with the more highly specialized branches. Medicine will then have developed to a point where all competent physicians are organized for highest efficiency in service to the public.

404 Professional Building

DISCUSSION

Papers of Dr. McBride and Dr. Vaughan.

Dr. D. C. Walt, Little Rock, Ark.—As a general practitioner I think the specialist is made more secure on account of our method of caring for patients only when we have to. We are not progressing as we should because we wait to cure the patient of some well defined symptoms instead of caring for him to keep him from developing a diseased condition that we can classify by symptoms. I do not like the group system, because I would not like to confine myself to any one man that did not in my opinion meet the requirements.

I have attempted a line of work that I have grown interested in. I do not care for patients unless they will cooperate with me in trying to keep their physical condition the best possible by constant care. I have them come to my office at intervals as indicated from every day to once a month, or longer owing to conditions. I examine the blood pressure, lungs, heart, skin and mucous membranes, the vessels of the eye, pupils

and finger nails, also weigh the patient, give of course a complete examination of the other organs, and the blood, urine, etc., as indicated.

The vessels of the eye, mucous membrane, the skin and blood pressure with the cultivated touch of the pulse will give the every-day changes that will make it possible for us to prevent graver symptoms from developing.

I have continued this class of work for a number of years and been able to keep the patients interested in helping me care for them with a daily effort for ten, fifteen and twenty years, and they realize the value in their high grade of efficiency.

While I have the specialist examine my patients when necessary, I never consider any patient's condition such that he does not need general care, and I think the practitioner knows better how to render that service than the pathologist or other special men. I never voluntarily turn a patient over to another for complete control unless I do not expect to treat him any more.

Dr. Sydney R. Miller, Baltimore, Md.—I would be unfair to my conscience if I did not voice my opinion that I disapprove of group medicine as a business. My reason is this. I think the charge that has been brought against group medicine in general of commercialism is not true. I am open to conviction as to whether the many groups that are springing up throughout the country best meet the needs of the public and maintain the personal contact that I personally feel is absolutely fundamental to satisfactory practice. My own personal view is that the aim should be towards developing all future groups in medicine as well as present ones into individual groups, that is, each person should be his own group. I do not mean that there should be no association whatever, but I do feel that in attempting to practice medicine in groups far too many men have been made automatic in their working, one depending on the other to do the essential work and depending too much upon things which are not essential. For example, look at the number of simplified basal metabolism apparatuses that are being foisted on the medical profession and going into doctors' offices and the number of men attempting to use these instruments without knowing the inherent dangers.

We find people springing up as specialists in protein sensitization. The medical profession has always shown a tendency toward faddism and group medicine at the present time is a fad which, unless properly curbed, is going to do a great deal of harm and has already done it in terms of dissatisfaction among a great many general practitioners. Most practitioners are men of intelligence and most practitioners can arrive at an accurate diagnosis of their cases in practically 70 to 80 per cent of the cases if they will employ their own intelligence and not to try to use these highly specialized methods.

I do not mean to imply that any one of us can be perfect in most of the things that are called specialties, but that the average practitioner should know how to examine the eye grounds, transilluminate a sinus, make bacteriologic examinations, do a simple blood count, know when albumin is significant and when it is not, etc.; and if you take the sum total of all these methods you will find that they constitute the basis for the specialism of the day. You will find, if you analyze them, that they have not increased our diagnostic ability. Moreover, these groups have not gotten very far ahead with what is more important still, therapeutics. I am inclined to feel that unless we look out we are going to lose out with the public because of the lack of personal contact. This is no criticism against good group medicine. I know there are groups very splendid in their working. What I am speaking of is the tendency toward which medicine is moving, whereby the practitioners have become aware of their own paucity in material income as compared with that of the specialists in the larger cities, resulting in lack of normal medical attention in the smaller rural communities.

Dr. T. Z. Cason, Jacksonville, Fla.—Since 1919, I have been with a so-called group. We say we are associated. We want to get away from the term "clinic" because that has gotten in bad. There are a few points I would like to bring up. In the first place I do not altogether agree with Dr. Vaughan that the group must be composed of men of equal ability. I do agree in this sense, that the head of each group, surgical, medical, gynecological, must be of equal ability, but there certainly could be some men in each department, working under the head of that department but responsible to the other men in the group, men who have the respect of the other doctors, but who are not equal in ability to the head of the department.

That brings up another point: how far are we to go in our advice to the patient who is referred to us by some one from out of town. Are we to give him the diagnosis in full and outline the treatment in detail, or to communicate directly with the doctor back home and let him handle the matter? Possibly the only way to settle this is by the individual case.

Since the first of June we have had our outpatient department in our hospital. So far we believe this to be the ideal arrangement.

Dr. L. B. McBrayer, Sanatorium, N. C.—I want to state a few things that I consider fundamental in the practice of medicine today. Our present medical education does not fit a man to become a specialist and yet the majority of graduates in medicine want to bloom out into specialists immediately. There is more or less drouth of practitioners in the country throughout the South and I am not very much surprised. We are requiring a certain kind of medical education, requiring the men who study medicine to pursue that course and pass an examination before the state board of medical examiners before they can practice in any state, and then if a man goes out in the country he cannot use what we require him to study. Group medicine is an effort on the part of our profession

to apply the science of medicine to the patient. It is an evolution. I heard of a patient who went into a group in a certain Southern state, sent there by a general practitioner in a country town. He stayed a week, spent $200.00 and decided to come home and rest and get some more money. That is the tendency of many of these groups. That is a very serious criticism. It is a fact, nevertheless, that the people are not getting what is coming to them from the medical profession. I do not think any doctor will gainsay that statement, and, what is more, the people know it. A great many of those who do not are fast finding it out. That is a very serious question for the medical profession to solve. The people are going to demand sooner or later better service and more capable service from the medical profession than we are giving. Group medicine is an effort on the part of the medical profession to supply that need. In my State a layman wrote this in an editorial: "Medicine is a science; the application of the science of medicine to the patient is an art; a great many men who are applying the science of medicine to the patient are very poor artists." When a layman begins to think such things and when they write such editorials, it is time for us at least to put our ears to the ground and hear the rumblings.

Dr. E. B. Bradley, Lexington, Ky.—It seems to me that of the objections to group medicine there are really only three that are important. The first of these is that the group loses personal touch with the patient; second, that it commercializes medicine; and third, that the best consultant is not always selected. There are other objections, but they are more easily answered.

Dr. Miller practically confesses that he does practice group medicine. In a city like Baltimore he has a wide choice of different specialists. However, I dare say that he utilizes to a great extent one specialist for the nose and throat, another for genito-urinary diseases, another for roentgenology, etc. He practices group medicine without actually being a member of a group. As Dr. Vaughan brought out in his paper, a group is no stronger than its weakest link. If there is a specialist in the group who is not capable of making expert examinations, he has no business in the group. All patients are entitled to the best advice whether it is from a member of the group or from one outside of it. Belonging to a group does not keep one from getting advice of some one entirely disconnected with the group in case it is thought advisable.

By commercialism in medicine I suppose is meant exploitation of the patient in order to make money out of him. Those who make this objection say that it is more expensive to make group examinations; secondly, that there are many useless examinations made. Personally, I do not believe that it is any more expensive to the patient for the same number of examinations to be made by a group than by different specialists situated, it may be, in different parts of the city. The doctor in the group who is responsible for the patient usually has the right to say what the patient should be charged. In a very large percentage of cases the total fee of the examinations is much less than it would be if the patient had to pay a separate fee to each specialist.

This is the great advantage in being a member of the group: the fact that in every case if he considers it necessary the physician can have different specialists examine the patient and all the necessary laboratory work done, even though the patient is able to pay only a nominal fee. The member of the group does not feel that he is imposing on his colleagues. He might if he did not belong to a group. The objection that personal touch between the patient and physician is lost may or may not be valid. This will not be true if the group is conducted properly. Necessarily many examinations are made by others, but each group should have in it one physician who is responsible for the patient and to whom the patient may turn for advice. If the survey is only diagnostic in its nature, the family physician must still with a full knowledge of the group's findings exercise the same care as in all other cases.

Dr. C. L. Minor, Asheville, N. C.—There is one thing I would like to dwell on. If there is a tendency toward commercialism, I think the psychology is simple. When a man handles his own patients the human element comes in. You know the patient personally. You will think of that much more than of any reward. When you see a patient in a group the difficulty of knowing him and giving that personal contact is absent and naturally the other side comes more to the front. The extreme difficulty of group medicine is the question of the psychology, the contact between doctor and patient. That is a difficult thing in any practice. We know that some men are so built that they cannot come in very close contact with the patient, but certainly with the old-fashioned regular practitioner that element of medicine was an important one. Your patient was your friend and not just No. 27. The doctor who gets closer to his patients will accomplish more. That personal contact is what is missing in group medicine. It is infinitely difficult to establish such a contact under group conditions. It is not a thing for which I feel I have any solution. We are in evolution and something is going to work out of it. The public is not satisfied and if the public is not satisfied the profession has got to do something to satisfy it. We have to make the patients feel we are personally interested in them. If group medicine can satisfy the patients that we have their personal interest at heart it is going to win. If not, it is going to die. Patients have told me when they visit these groups they feel as though they were run through a machine. They saw Dr. Jones and probably he was very scientific, but they felt they did not get the interest of Dr. Jones. In so far as Dr. Jones fails to show interest in his patient, no matter how scientific he is, he will not make a success of medicine.

Dr. T. P. Sprunt, Baltimore, Md.—Because we are in a process of evolution it is always difficult to predict the path that the evolution is going to take. We have some knowledge of medicine. How would we ourselves like to be treated? I think that group medicine in some form is going to stay; whether it will be in a compact group or of a looser type will depend a good deal on the circumstances. In the smaller communities the compact group will be the only type available. It is not so much improvement in the general practitioner's work as it is a check on the specialists' work that we need. I was very much interested in Dr. Miller's apotheosis of the general practitioner, and I hope that with improvement in medical education it may become a true picture. It seems to me that medical education is now tending to train men to be specialists. They are taught in the department of medicine certain definite diseases, in the department of surgery surgical technic in certain definite surgical diseases, in the department of laryngology diseases of the nose and throat. There is very little taught about chronic diseases or about the correlation of lesions and the integration of diagnostic studies; and this information is, I think, the most important factor in group medicine. The financial situation is, of course, important as well as the personal relations, which have been so much emphasized. I think the members of a group can maintain as close personal touch with the patient during the period of therapy as the general practitioner can, but an effort should be made to maintain a closer personal touch even while he is going through the diagnostic study.

Dr. Sydney R. Miller, Baltimore, Md.—There are just two points I wish to bring out. One is the question Dr. Bradley mentioned about making it more readily possible for a patient with small means to have a complete study in a group. That is not true in Baltimore. A patient comes in to me and says he can pay $25. He is able to secure on a pro rata basis whatever service he needs.

The other point I want to emphasize is that I personally hold myself responsible for the diagnosis. In other words, I think one of the crimes of the day is the facility with which a patient who is presenting symptoms of disease in the intestinal tract, or the genito-urinary system, or any other system, can go to a laboratory and have a diagnosis made. If you would use your God-given intelligence you would save annoyance, time and finances.

Dr. C. L. Minor, Asheville, N. C.—Diagnosis can be worked out by a group, but when it comes to the question of planning out the treatment, it must be the product of one mind. Diagnosis can be the consummation of many men's thinking, but not treatment.

Dr. McBride (closing).—It is not surprising to me that men who do not practice group medicine should attack it. It is surprising, however, that one who really practices group medicine, as Dr. Miller does, is so anxious to avoid the term and is unwilling to place his confreres so they will be easily accessible to the patient and to himself for frequent consultation. If he does not believe it works a hardship on the patient I will tell him that a lady recently told me she had carried her husband to Johns Hopkins for medical care and that they spent more time and money on taxi fares going from one physician to another than they did on doctors' bills. Dr. Miller admits that he does frequently send patients to other specialists and that they divide proportionately whatever fee the patient can pay. I do not want to criticize his method, but I do say that one fee paid to a group with all the physicians consulted under one roof would be more business-like and get more accurate results than any loose co-operative plan.

As for the question of individual touch, it would not necessarily be lost. Each specialist gives the patient all the attention he needs in his department and sends him back to the internist, who puts all the findings together, his own along with the others. He spends all the time necessary and puts whatever interest into the case that he desires or that the patient needs.

I cannot understand the criticism of commercialism. From the start our difficulty has been to arrange our fees so they would not interfere with our doctor friends in the city. We have constantly found ourselves charging the patient in each department only the actual cost of his investigation and allowing the internist to charge an ordinary fee for his services, making, so to speak, a profit in only one department, whereas the same patient would pay under the old plan each doctor's fee, the aggregate of which would be much more than ours. We do not intend to commercialize medicine, neither do we wish to be in the attitude of underbidding our colleagues. But there are many things which could be said pro and con on group medicine. I would suggest that those who do not know about it investigate it, for it has, I believe, come to stay. It means too much to both the doctor and the community to be merely a passing fancy.

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EDITORIAL DEPARTMENT

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ARTERIOSCLEROSIS AND HYPERTENSION

There are four types of arteriosclerosis, according to Dr. Geoffrey Evans,* to-wit: nodular, diffuse hyperplastic, senile, and Menckeberg's sclerosis, although these do not include all the varieties which are encountered.

The type which he discusses at greatest length is that which is termed "diffuse hyperplastic sclerosis," which is the "diffuse arteriosclerosis" of Osler. Dr. Evans regards the nature of arteriosclerosis as essentially inflammatory. "The essential lesion of diffuse hyperplastic sclerosis is a thickening of the intima in the smaller, and smallest arteries," and this lesion constitutes the structural change by which this type of sclerosis is recognized. It occurs "chiefly, or only," in the terminal arteries and their parent vessels. It is found most often in the kidney and may occur in this organ alone, but more commonly in both kidney and spleen. Next in frequency of involvement is the brain, and then follow the pancreas, liver and adrenals. The vessels of the stomach and intestines are less often affected and it is extremely uncommon in those of the heart. This localization of the process is a very striking feature and accounts for the varying clinical picture which is met with.

The intimal thickening consists of proliferated endothelial cells, connective tissue and elastic tissue, and hyaline intercellar substance, and represents a very active process. In most cases, but not in all, there is hypertrophy of the media which is probably the result of the increased blood pressure that is usually present. This medial hypertrophy, however, is not regarded as an essential or constant factor.

The most important clinical evidence of diffuse hyperplastic sclerosis is the so-called idiopathic hypertrophy of the heart, meaning by this term hypertrophy that is not due to disease of the heart or lungs. This hypertrophy, as well as the thickening of the intima, is to be regarded as a compensatory phenomenon. "The one essentially pathological sign of diffuse hyperplastic sclerosis is renal sclerosis in one of its several forms." Associated with cardiac hypertrophy is elevated blood pressure, and these two clinical signs are regarded as definite indications of diffuse hyperplastic sclerosis. The height to which the mercury must rise to afford evidence of sclerosis may be a subject for discussion, but Evans thinks that a systolic pressure of 180 may be considered fairly as outside the normal range.

The clinical evidence of diffuse hyperplastic sclerosis are likewise the important clinical indications of hyperpiesia. Hence, it is concluded that the latter is the clinical expression of the former condition. While medial thickening may be explained by an elevated blood pressure,

*Evans, Geoffrey: Gaulstonian Lectures, Brit. Med. J., XXIV, 31, March 17, 1923.

mechanical strain cannot account for endothelial cell proliferation and subsequent fatty degeneration; nor can it explain the chief incidence of the lesion in the kidney and spleen, and its comparative infrequence in many other organs and especially its absence from the skeletal muscles and heart. If increased blood pressure fails to account for the development of diffuse hyperplastic sclerosis which is the pathological expression of hyperpiesia, and the older view that the vascular lesion is responsible for the clinical phenomena be abandoned, it is obvious that the two conditions must be due to a common cause.

Renal sclerosis constitutes another group of diseases in which these clinical phenomena appear. "There is some degree of renal sclerosis in all cases of diffuse hyperplastic sclerosis, and there is some vascular lesion in all cases of renal sclerosis." In chronic nephritis there is a tendency for the kidney lesion to be associated with diffuse hyperplastic sclerosis and cardiac hypertrophy, but vascular hypertension and hypertrophy of the heart, although characteristic, are not essential features of the clinical picture. While it is possible to assume that in the arteriosclerotic group the vascular lesion is the cause of the renal lesion, this is unlikely, as in chronic nephritis it cannot hold. It seems more logical to assume that diffuse hyperplastic sclerosis, hyperpiesia, and renal sclerosis are due to the same cause, and from the evidence in hand it is probable that this cause is circulating bacterial toxins.

The question of the mechanism of the production of hypertension remains unanswered. More forcible heart action and raised vascular tension, resulting in cardiac hypertrophy and medial thickening, are probably due to obstruction in the capillary area. If this be true we shall have to assume that the toxin or toxins which cause the inflammatory reaction in the smallest vessels likewise exercise a constrictor action upon the capillaries. This offers a fertile field for investigation.

URETERAL RETENTION CATHETER DRAINAGE

The use of the ureteral retention catheter has become common in urological therapeusis, notably in the treatment of pyelitis, pyelonephrosis and impacted stones. It has restored to usefulness many a kidney which at first thought might be considered useless and requiring nephrotomy or nephrectomy. The remarkable faculty of the kidney for improving its function under such circumstances must be observed to be fully appreciated.

Fixation of the Ureteral Catheter.—After introduction of the catheter comes the problem of fixing it in place. The practice of wrapping a piece of adhesive plaster about the catheter and then fastening this to the inner aspect of one thigh, is to be deplored because flexion and extension of the thigh are apt to dislodge the catheter; and turning of the patient on the opposite side renders catching of the urine troublesome.

If adhesive is fastened to the catheter and then wrapped about the body of the penis, or is attached to the vulva or groins, voiding of bladder urine (from the opposite kidney) will soon soak the adhesive and render it useless, with the result that it will slip up and down like a loose cuff.

The most practical technic is to tie a heavy piece of linen or silk ligature snugly about the catheter near the urinary meatus; and an inch or more from there attach each end of the ligature to a piece of adhesive plaster. This latter can be fastened around or along the sides of the penis in the male. In the female, it is

well to shave the upper vulva and groins and extend the adhesive along the groins.

Unstopping of Catheters.—Plugs of mucus, pus and blood clot obstructing the catheter demand careful attention. When stoppage is noted if the patient is able to cooperate, simply a few hearty coughs will often clear the catheter lumen and reestablish the flow. If this fails, and the patient is physically able to be moved, the kneeling posture with the body erect, and a repetition of coughing will further increase the chances of expelling the obstructing material. A little routine coughing every hour or so is excellent prophylaxis against stoppage.

Should this fail, irrigation of the kidney pelvis, beginning with gentle suction rather than injection, will become necessary. Suction is more effective if coughing accompanies it.

A large ureteral catheter, size No. 9, is desirable, but not always capable of being introduced. An average of less than 8 or 10 drops a minute, when water is freely taken, is suggestive of stoppage. Twenty or thirty drops a minute would be better.

Kidney Irrigations.—Although this is a routine with some, the need of irrigation is debatable in many instances. For example, if the kidney pelvis is normal or little increased in capacity, the urinary output is abundant, there is no evidence of stoppage of the catheter, the patient seems to be doing well and the fever and other toxic symptoms are abating, little can be gained by irrigations. On the other hand, if the kidney capacity is increased, say to 10 mils or more, or if any of the above conditions do not obtain, much may be gained by insuring a clearing out of the contents of the kidney pelvis by irrigation from one to three times a day. Of course, no force should be employed.

Irritating substances such as mercurochrome should be avoided. Instead, bland solutions of normal saline, boric acid, acriflavine 1-2000, etc., are better than drugs yielding precipitates, e. g., silver nitrate, argyrol and the like, however bactericidal they may be. The benefit is largely cleansing and not antiseptic.

Amount of Forced Fluids.—Since water in too great a quantity can do actual harm, specific directions should be given the nurse. Fluids are used to increase the urinary output and that alone should be the guide. In an adult 3000 mils of urine in 24 hours should be the general maximum and if the patient responds readily, the amount can be reduced safely to 2000 mils or thereabout. It is better to push the liquids mainly by day so that rest may not be interfered with at night.

Duration of Ureteral Catheter Drainage.—This is variable. If the temperature soon drops to normal, it is a sign that probably the kidney parenchyma is very little involved. In such an instance the catheter may be withdrawn in two or three days. Where fever, chills, nausea and vomiting evidence continued toxemia, and the catheter lumen can be kept patent, the catheter may be left in place for seven to ten days. After that it is well to withdraw it because the patient may then be able to do without it. If not, a fresh catheter can be replaced. The presence of a retention catheter has a tendency to soften a constricted area. It is often demonstrable by having the irrigation fluid return around the catheter into the bladder. When that takes place, the presence of the catheter is no longer needed. A catheter may permit the passage of urine and yet be partially clogged with sediment so that it serves as a sort of filter and keeps back the more solid lumps of mucus, pus and blood.

Finally, one should avoid making pyeloureterograms during the acute febrile stage of kidney infection. Likewise, all things being equal, it is generally unwise to attempt to dilate a ureteral stricture or remove a calculus during that stage, but instead one should drain the kidney pelvis with a ureteral retention catheter where possible until the patient has reached his or her optimal improvement. Differential functional tests are useful throughout the course of the illness as a comparative index to progress.

TREATMENT OF HOOKWORM

The most striking advances in preventive medicine of late years have been in the prevention of infectious diseases. Among the most striking advances in curative medicine have been the methods of treatment of infectious diseases.

Hookworm has been treated with varying degrees of success with several different drugs. Thymol, beta-naphthol, chenopodium and recently carbon tetrachlorid have been extensively used as anthelmintics. The latter appears from comparative experiments[1] to be more efficient than the other three mentioned, and to be safe when properly administered.

In this number of the JOURNAL[2] appears a paper describing the results of treatment with carbon tetrachlorid of infected soldiers at Fort Benning, Ga.

Three mils is an average dose and one or two treatments are all that are necessary. In larger doses it has been shown by experiments upon condemned criminals, who were autopsied after execution, in an occasional instance to produce lesions of the liver.

Hospitalization during treatment is not essential, which is a distinct advantage. The patient is sent away after dosage with the admonition not to partake of alcohol. Lambert,[3] who reports observations upon the treatment with carbon tetrachlorid of 20,000 cases of hookworm infection, concludes that it is an unusually efficient anthelmintic. It also has been found to be very efficient upon dogs.

Clinically, in doses of three mils this drug has been shown to be efficient in the removal of hookworms from the human intestinal tract. In this dosage it is not toxic. It is not an expensive drug, and during treatment with it hospitalization of the patient is unnecessary. Evidence, on the whole, points to it as probably the best means of combating this disease. In the South there is ample opportunity for putting this treatment of uncinariasis to further test.

Book Reviews

Carriers in Infectious Diseases. A Manual on the Importance, Pathology, Diagnosis and Treatment of Human Carriers. By Henry J. Nichols, M.D., M.A., Major, Medical Corps, U. S. Army; Instructor in Bacteriology, Parasitology and Preventive Medicine, Army Medical School, Washington, D. C. With a Section on Carriers in Veterinary Medicine by R. A. Kelser, D.V.M., M.A., Captain Veterinary Corps, U. S. Army; in Charge Veterinary Laboratory, Army Medical School, Washington, D. C. 184 pages. Baltimore: Williams & Williams Co., 1922.

In this little book the author has summarized the present day concepts of the carrier problem or, as he chooses to call it, "the science and art" of "phorology." Disclaiming any intention of writing a complete text book with historical and bibliographic development, he sets himself to the goal of compressing into small space all that is most valuable in current medical theory and practice within the field covered.

Part I deals with general considerations. It considers the carrier from the public health viewpoint and presents the general pathologic principles involved in the production and continuance of the carrier state, together with the rationale of diagnosis and treatment.

Part II deals systematically with individual diseases. For each there is a general survey of the particular problems presented, a short statement of the significant pathology, indication of the essential points in determining clinical and laboratory diagnosis, and description of the technic to be employed for the collection of diagnostic specimens. Finally, there is a short statement on treatment.

Part III sketches the general program employed for carrier work in preventive medicine. The book is concluded with a review of "Carriers in Veterinary Medicine," which deals with bacteria and protozoa pathogenic for both man and the lower animals, as well as for the lower animals alone.

The author covers much ground in few words. The book is valuable for the general physician and a necessity for the health officer.

1. Docherty, J. F.: J. A. M. A., August 11, 1923.

2. Cooper, A. T.: This issue, p. 689.

3. Lambert: J. A. M. A., December 16, 1922.

Southern Medical News

AMERICAN ROENTGEN RAY SOCIETY

The annual meeting of the American Roentgen Ray Society will be held September 18 to 21 at the Congress Hotel, Chicago. There is to be a number of eminent contributors from foreign countries. High voltage x-ray will have a prominent place on the program. Any one doing x-ray work will find this meeting of special interest

MEDICAL WOMEN'S NATIONAL ASSOCIATION

The ninth annual meeting of the Medical Women's National Association was held in San Francisco, June 25-26, in conjunction with the American Medical Association meeting, Dr. Grace E. Kimball, Poughkeepsie, N. Y., President. Dr. L. Rosa H. Gantt, Spartanburg, S. C., was re-elected Treasurer. The next annual meeting will be held in Chicago, June 1924.

ALABAMA

It is said that Tuscaloosa is the first city in the State to adopt the State's new model milk ordinance. Gadsden adopted the law June 19. The modern law establishes a uniform grade of milk throughout the State and protects both the dairymen and the consumers.

Dr. Seale Harris, Birmingham, has established in the medical department of the University of Alabama, Tuscaloosa, the Ann Monks Harris scholarship in memory of his mother.

The Federal Government has reappointed Col. William D. Wrightson, son-in-law of the late Gen. William C. Gorgas, as malaria expert, with jurisdiction in ten counties in Northern Alabama.

Deaths

Dr. John Mordecai Anderson, Montgomery, aged 57, died June 30 from pneumonia.

Dr. Edward Burton Ward, Selma, aged 63, died June 10.

Dr. H. L. Wade, Liberty, died recently.

ARKANSAS

Missouri and North Arkansas Railway Surgeons met jointly with the White County Medical Society in Searcy recently.

Dr. Arley Doyne Cathey, El Dorado, and Miss Ida Neumann, Stuttgart, were married recently.

Deaths

Dr. DaCosta Walker, Hot Springs National Park, aged 42, died suddenly June 30 from heart disease.

Dr. Oscar Eve Jones, Newport, aged 40, died suddenly July 14 from heart disease.

Dr. Noah S. Kite, Pine Bluff, aged 83, died July 4 from senility.

DISTRICT OF COLUMBIA

The General Education Board, New York, pledged $250,000 toward an endowment for Howard University School of Medicine provided the University would raise a similar sum through public subscriptions by July 1. Howard University has raised more than that amount. Isador Straus contributed the last $3,000 of the needed sum. Following this contribution colored people from various parts of the county pledged an additional $15,000, making a total endowment of $515,000.

Dr. MacPherson Crichton and Mrs. Muriel Lynch, both of Washington, were married June 9.

Deaths

Dr. Stephen Driver Brooks, Washington, aged 69, died July 4 at Los Angeles, Calif.

Dr. Alice Laura Scott Hill, Washington, aged 66, died July 3.

FLORIDA

Dr. A. C. Hamblin, Tampa, has resigned as District Health Officer for the State Board of Health and has accepted the position of City Health Officer of Tampa.

Deaths

Dr. Stephen Russell Mallory Kennedy, Pensacola aged 45, died July 11 from heart disease.

Dr. D. Fort Anderson, Orlando, aged 93, died June 10 from senility.

Dr. William Horace Sibley, Jacksonville, aged 78, died recently.

Dr. George Delos Kennedy, Mandarin, aged 42, died suddenly July 13.

GEORGIA

Dr. H. N. Page, Augusta, has been appointed Chief Surgeon of the Charleston and Western Carolina Railway.

Jefferson County Medical Society was recently reorganized. Dr. J. J. Pilcher, Wrens, was elected President; Dr. W. B. Jordan, Bartow, Secretary.

Wilkes County Medical Society was recently reorganized. Dr. Lewis R. Casteel, Metasville, was elected President; Dr. Charles E. Wills, Washington, Vice-President; Dr. Addison W. Simpson, Washington, Secretary-Treasurer.

Seven counties of Georgia, Cobb, Decatur, Baldwin, Washington, Telfair, Clark and Wilkes, want the health demonstration which the American Child Hygiene Association will establish and support for five years somewhere in the South. The Southern unit will comprise a mothers' clinic, a baby clinic, a training school for mothers and an educational campaign for better babies.

Robert F. Maddox, Atlanta, President of the Atlanta National Bank, has been elected President of the State Board of Health, succeeding the late Dr. William H. Doughty, Jr.

Dr. A. F. Weathers, Shellman, has moved to Albany.

Dr. A Richard Bliss, Jr., Professor of Pharmacology, Emory University School of Medicine, Atlanta, resigned to accept the professorship of Physiology and Pharmacology at the University of Tennessee.

Dr. D. T. Rankin, connected with the Georgia State Sanitarium, has resigned to become a member of the staff of the Allentown State Hospital for the Insane, Allentown, Pa.

Dr. V. H. Bassett has been elected City Health Officer for Savannah.

Dr. Wm. H. Goodrich, Augusta, has been elected Dean of the University of Georgia School of Medicine, succeeding the late Dr. William H. Doughty, Jr.

Dr. Seale Harris, Birmingham, Ala., has established in the Medical Department of the University of Georgia the James Coffee Harris scholarship in memory of his brother.

Deaths

Dr. Frank E. Howald, Atlanta, aged 62, died July 14.

Dr. William Henry Doughty, Jr., Augusta, aged 67, died June 22.

Dr. John Henry Griffin, Armuchee, aged 47, died June 27 at a hospital in Atlanta.

Dr. James W. Lambert, Luthersville, aged 75, died June 16.

Dr. Miller Bone Hutchins, Atlanta, aged 59, died July 6 from cerebral hemorrhage.

Dr. John Alvin Alley, Atlanta, aged 51, died July 3.

Dr. James Jackson Watkins, Glennville, aged 59, died June 9.

Dr. William A. Anderson, Atlanta, aged 73, died June 9 from cerebral hemorrhage.

Dr. William L. Sikes, Sylvester, aged 72, died June 22 following a long illness.

KENTUCKY

The Kentucky State Medical Association will meet at Crab Orchard Springs, September 17-20.

Bracken County Medical Society was recently organized. Dr. W. B. Wallin was elected President; Dr. J. C. Norris, Vice-President; Dr. J. M. Stevenson, Secretary-Treasurer.

Estill County Medical Society was recently organized. Dr. Cornelius Marcum, Irvine, was elected President; Dr. S. T. Scrivner, Irvine, Secretary; Dr. A. Agee, Treasurer.

Johnson County Medical Society was recently reorganized. Dr. J. P. Wells was elected President; Dr. G. V. Daniel, Vice-President; Dr. Ernest E. Archer, Secretary; Dr. Paul B. Hall, Treasurer.

Miss Jessie O. Yancey has been selected as the head of a social welfare and health department in the rural schools and community of Fayette County.

Mrs. Anne Traber, Russell, Kas., has been elected Public Health Nurse, to succeed Miss Nellie Baber, resigned.

The State Board of Charities and Corrections has established mental clinics at the Central, Eastern and Western State Hospitals for the Insane.

A Board of Examining Surgeons was recently organized in Tompkinsville. Dr. Arthur G. Cosby, Fountain Run, is President. Other members of the board are: J. T. Smith, Gamaliel; Eugene E. Palmore, Strode.

Dr. John R. Brayton, Hardy, and Miss Bernice Marie Havens, Kokomo, Ind., were married June 30.

Deaths

Dr. John M. Frazee, Maysville, aged 85, died August 1.

Dr. David Woolfolk Barrow, Lexington, aged 41, was killed the latter part of July when the automobile which he was driving ran into a stone fence.

Dr. W. W. Ray, Springfield, died recently.

Dr. Henry B. Myers, Ewing, aged 57, died July 26.

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

ILEO-COLIC STASIS: ITS CLINICAL CONSEQUENCES AND TREATMENT*†

BY SIDNEY K. SIMON, A.B., M.D.,
New Orleans, La.

It is manifestly impossible, within the brief space of a single article, to enter into a full discussion of so comprehensive a subject as chronic intestinal stasis. My purpose, upon the present occasion, is merely to record some individual impressions and to touch upon the fundamental factors underlying the etiology and clinical manifestations of this highly important disease complex.

The ileum and the first portion of the large intestine up to the splenic flexure, is developed from the mid gut in the embryo, while the terminal segment of the colon springs from the hind gut. The embryonic origin of these two segments of bowel displays a controlling influence along certain lines on the subsequent physiology of the gut after birth. The ileo-cecum and the right segment of colon are concerned primarily with the absorption of the fluid content of the feces, while the descending and pelvic colon constitutes, in effect, a storage channel for the dried out feces, awaiting discharge from the bowel. Because of the predominant absorptive function of the ileo-colon, the vascular distribution is necessarily greater than that found in the left colon. A further retardation of the fecal current is brought about normally in the cecum and ascending colon, through the medium of anti-peristaltic waves, which start initially in the region of the hepatic flexure. The purpose of this tendency to a backward flow toward the ileo-cecal valve is determined largely by the need for more complete dehydration of the feces in the right colon. The maximum degree of bacterial growth in the feces is likewise to be found in the ileo-colon. The number of live organisms, it is true, is rapidly reduced after passage through the ileo-cecal valve, though the absorption of toxic substance continues in the lower bowel with progressive diminution toward the sigmoid. Nature has provided a zone of protection against the entrance of bacterial toxins into the systemic circulation through the intermediation of the liver. All toxic bodies, in fact, arising in the intestinal tract are promptly detoxicated by the hepatic cells.

X-ray studies have demonstrated that the mass movement of the partially dried out feces is initiated in the cecum and proceeds in regular rhythmic waves toward the anus. These peristaltic waves are feeble in the first segment of the colon and in a limited degree are opposed by anti-peristaltic waves. From the splenic flexure to the sigmoid the waves are stronger and more uniform, carrying the

*From the Department of Internal Medicine, School of Medicine, Tulane University.

†Read before Southern Gastro-Enterological Association, meeting conjointly with the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

hardening feces into the storage reservoir in the pelvic colon. When through any cause inhibition of this normal mass movement occurs, a distinct pathological condition is set up, resulting in increased bacterial activity in the semi-liquid fecal mass of the ileo-colon which is closely followed by an increased absorption of toxic substances. In the presence of this extra load the liver may fail in its function of completely detoxicating this poisonous material, so that eventually some of it may find its way into the systemic circulation.

The causes leading up to a chronic stasis in the lower intestinal tract are of manifold nature. Two fundamental pathological conditions furnish the basis, however: first, a developmental or congenital weakness or atony of the muscular layer of the bowel wall; and secondly, a local interference with the normal peristaltic movement, mechanical in type. Under the first or muscular atony group are included: (1) congenital bodily inertia; (2) the inervating, depressing influence of long-continued chronic toxemic diseases; (3) coloptosis, which is commonly a part picture of a general visceroptosis; (4) lack of physical exercise; and (5) the muscle changes brought about by senility.

In the second group, which is made up of mechanical interferences with peristalsis, the following factors are to be considered: (1) the presence of congenital or developmental bands, kinks, veils and membranes. The association of these accessory peritoneal overgrowths, with delayed intestinal movement, was first stressed by Sir Arbuthnot Lane. Their formation is to be ascribed to a defensive effort on the part of the bowel against abnormal traction or tension, which has its beginning probably, in most instances, in embryologic life. In the presence of these peritoneal overgrowths a partial degree of blocking of the fecal mass movement may take place, though it is to be doubted whether this factor plays as important a role in the etiology of chronic intestinal stasis as some authors would have us believe. (2) The formation of true peritoneal band-like adhesions, secondary to inflammatory conditions, arising in the appendix, gall bladder, pelvic organs and other abdominal structures. (3) Narrowing of the lumen of the bowel wall, due to inflammatory swellings, ulcerations, cicatrixes and tumors, either benign or malignant.

The clinical manifestations arising from a chronic stasis in the intestinal tract are expressed either in local symptoms, such as abdominal discomfort and pain, flatulency, constipation and diarrhea, or constitutionally, depending upon the absorption of toxins from a putrefaction of the fecal contents. Sir Arbuthnot Lane claims that in individuals of lowered vitality the symptoms are chiefly systemic. In this type of patient the congenitally atonic bowel becomes pathologically elongated, yielding eventually a more extensive surface for the absorption of toxins. On the other hand, in the more vigorous class of individuals peritoneal membranes and kinks are usually encountered. Hypertrophy of the bowel musculature is the common result of this condition rather than an atonic elongation, and the symptoms, therefore, are chiefly centered in the abdomen. No definite line of cleavage can be drawn, however, between such clinical types, since from my own observation the less vigorous chronic intestinal invalid may exhibit abdominal disturbances in addition to constitutional manifestations, while the stronger subject is not infrequently a victim of marked constitutional effects.

The chemical nature of the toxins derived from the putrefaction of the food products in the intestinal tract has not as yet been thoroughly worked out. It is certain that proteins form the basis of most of the pathologic toxins. Under aerobic conditions the bacteria split up the protein molecule into a carboxyl group, from which are eventually derived the well-known odorous substances of the feces, namely, phenol, indol, skatol and cresol. These substances after absorption into the blood are detoxicated by conjugation with sulphuric acid, forming the so-called ethereal sulphates, which are excreted from the body through the urine. The amount of indican present in the urine may, therefore, other things being equal, be considered as a fairly constant index

of the degree of aerobic proteolytic fermentation taking place in the intestine.

The anaerobic organisms are capable under favorable conditions of producing a more highly toxic group of bodies than the above. As a result of their activity, the protein molecule is first split into an amine radical, from which are derived by subsequent oxidation markedly toxic chemical substances, including tyramine, isoamylamine, sepsin, ethylamine and histidine. Experiments conducted on the lower animals have shown that each of these proteolytic products possesses distinctive toxic properties. Their effect upon the human body has also been demonstrated in a limited way, though it must be remembered that in experimental studies upon the human subject the all-important detoxicating influence of the liver is necessarily a missing factor.

The character and extent of the clinical phenomena which result from an intestinal toxemia have given rise to many divergent views. On the one hand, one finds a rather radical school of clinicians, who believe that many of the ills to which flesh is heir may be traced to the presence of intestinal toxins in the circulation. As opposed to this, some conscientious observers still maintain that fecal stagnation in itself is attended by insignificant sequelae. The reason for such a wide diversity of opinion is to be found in the lack of convincing experimental proof both in regard to the chemical nature of the intestinal toxins and to their effect upon the human organism. Clinical evidence would, nevertheless, seem to indicate that the persistent presence of toxic bodies in the systemic circulation, derived from the intestinal tract, does result in some instances in degenerative changes in the cellular structure of various organs, particularly the kidney, pancreas, breasts, thyroid, blood vessels, joints and skin. Moreover, in the absence of demonstrable tissue changes, functional disturbances unquestionably occur which can only be explained on the basis of an intestinal toxemia. Embraced under this heading might be mentioned such diverse functional disease conditions as bronchial asthma, headaches, neuralgias, migraine, muscle fatigue, inertia, lowered vitality, offensive perspiration, heart arrhythmias and palpitation, secondary anemia, and a host of digestive disturbances.

The diagnosis of chronic intestinal stasis cannot be formulated from the side of the clinical history alone. The condition is not synonymous with chronic constipation, though it is often erroneously considered so. As a matter of fact, a marked degree of intestinal stasis may exist even in the presence of a daily bowel evacuation. The term constipation should be restricted to a state of inactivity or retarded evacuation on the part of the pelvic colon. Failure on the part of the left colon to discharge its contents from day to day it is true may eventually result in a backing up of accumulated fecal material toward the ileo-colic junction. A daily bowel movement under such conditions would constitute, then, merely the breaking off of the proximate end of a solid fecal column which extends from cecum to anus. Even the existence of a diarrheal condition is not incompatible with the diagnosis of intestinal stasis, since the relaxed right colon might contain pockets of accumulated septic feces.

In the final analysis the x-ray assumes the most important role in the diagnosis of a true stasis. The retention of the barium meal in the ileo-colon after twelve hours represents a definite indication of a retarded fecal current in this region. Serial examinations, made at further periods of 18 hours, 24 hours and 48 hours, will afford added evidence in respect to the extent and the degree of the stasis present.

TREATMENT

In the treatment of chronic intestinal stasis much can be accomplished if the cooperation of the patient is obtained and medical measures are intelligently carried out. First in importance is the diet. The employment of stereotyped printed diet forms cannot be too strongly condemned. On the contrary, the various dietic idiosyncrasies of the patient should be carefully considered, especially in view of the fact that the diet employed must be persisted in over an extended period of time. The basic principle in the dietary involves the substitution of coarse, gritty and

fibrous food substances for the bland, easily macerated or digestible variety. Meats and eggs should be greatly if not entirely restricted, since their high protein content furnishes ready pabulum for the more septic types of proteolytic bacteria. The mushy forms of cereals should be replaced with courser varieties, such as bran, oat meal and corn meal. In the same manner the highly milled wheat flour should give way to the ground whole wheat products. Raw fruits and vegetables of all kinds should occupy a predominant place on the diet list. Butter milk and malted milk, in the main, act as better stimulants of intestinal peristalsis than does sweet milk. Sweets, as a rule, are objectionable, chiefly on a ground of their tendency to produce gaseous fermentation, but honey, I have found, acts as a mild laxative and rarely produces digestive disturbances. An important point frequently overlooked in these cases is the copious drinking of water. Unless special contraindications are present, the patient should be instructed to imbibe freely during the day, starting with two or three glasses upon arising.

Next in importance to diet is the carrying into execution of a well directed plan of abdominal exercises, which should be insisted upon as a regular routine twice a day and persisted in for several months. Abdominal massage may likewise prove useful, but in my experience does not yield as good results as properly directed physical exercise.

High colonic irrigations have been found useful by some observers in assisting in the removal of long-standing fecal accumulations in the right colon. In order to prove effective, this method must be carried out with painstaking detail, according to the plan recently described by Rehfuss and others. Trans-duodenal lavage also, either with the Ringer or Jutte solution or with tap water, has proven a valuable adjunct in my hands in many refractory cases.

Satterlee and Cotton, in their recent writings, make mention of an autogenous colon vaccine in the treatment of advanced cases of chronic intestinal stasis. The patient is first purged with castor oil and the third stool obtained, which is found to contain the most virile bacilli from the ceco-colic region, is plated for the cultivation of the colon organisms. The vaccines, thus prepared, are given as a routine every four days in doses of from 100,000,000 to 300,000,000. Bassler, some years back, reported success with colon vaccines in the same manner.

Pharmaceutical products should be made to play an insignificant role in the treatment of intestinal stasis. Indeed, the daily use of medicinal purgatives should be broken up and the patient should be made to see the logic and necessity of this plan. The salines, I believe, are especially to be condemned, since they liquefy the contents of the bowel and thereby increase the absorbability of the toxic bodies. Where a daily evacuation is not forthcoming at the beginning of treatment a simple tap water enema at bed time is preferable to purgatives. Petroleum oil, though recommended highly by many English authorities, is rarely productive of permanent good and should occupy only a temporary place, if any, in the treatment of intestinal stasis.

The surgical plan of treatment in refractory cases of long standing has been enthusiastically advocated by Lane, Moynihan and others in England, and notably by Bainbridge in this country. The field of application for this radical plan of procedure should be limited to those rare cases where a carefully instituted medical regime has persistently failed.

Clinical results following the employment of Bulgarian or acidophilus milk or cultures have been disappointing. The high lactose content of the milk cultures frequently acts as a mild laxative.

DISCUSSION

Dr. A. W. Calloway, Asheville, N. C.—I am trying to determine, if possible, the reason for early infection in some cases of pulmonary tuberculosis. Gastro-intestinal tuberculosis has, to my mind, been approached until recent years in the wrong way. It has been described as a tuberculous diarrhea, which it is not at all. You may as well speak of constipation as well as diarrhea so far as intestinal infection is concerned.

The work of Carman and Brown, verified by my own work, has proven that we can with the x-ray and clinical observation reasonably diag-

nose gastro-intestinal tuberculosis long before its full symptomatology has developed. In pulmonary tuberculosis an important point is the thorough investigation of the gastro-intestinal tract. We know that 85% of tuberculous infections take place in the ileo-cecal region. Why does infection take place there? Dr. Simon's paper has perhaps given us an explanation for some cases. Certain gastro-intestinal conditions offer easy infection from the tubercle bacillus. Tubercle bacilli can pass through the membrane and I think that is the manner of most infections. Terminal tuberculosis has been an unfortunate description of gastro-intestinal tuberculosis and men, in speaking of it, infer to the terminal stage. The essayist has offered a possible explanation why 85 per cent of the cases of intestinal tuberculosis have involvement in this region.

Dr. John L. Jelks, Memphis, Tenn.—There are two varieties of intestinal obstruction, one an inflammatory obstruction and another a congenital obstruction. In the first place, you have a valve at the ileo-cecal juncture of the large and small intestines. A membrane comes over from the parietal peritoneum posteriorly on the gut and wraps around the ileum. In such a case you are going to have obstruction. It may not be complete. It is likely you have another membrane coming from the lateral wall and over the cecum and a cecal stasis as a result. These two are congenital structures. That is why Dr. Calloway gets cecal stasis and gets a place for the lodgment of tubercle bacilli. It is the same way with the rectum. Almost all of the rectal tuberculosis begins in the rectal valves. I refer of course to those cases in which the bacilli come from above and usually are secondary to tuberculosis of the lung or to bovine tuberculosis. The intestinal veils referred to may contract and produce obstruction or the inflammatory adhesions will produce obstruction as the result of an acute or chronic appendicitis or other inflammatory condition. These adhesions may or may not give the patient any trouble. However, they may produce the same effect here as pericolic membranes over the cecum. In this class of cases you get intestinal toxemia. In palpating over the cecum you get a succession note and distention note from percussion showing that you have obstruction. You have a sacculation, and in these cases you get indicanuria and other signs and symptoms of intoxication.

When you have this class of case (I am not referring to the tuberculous class now) there are several methods of getting rid of it. Medicine will not do it. It is a strictly surgical condition. Lane has advised taking out the colon. That is too radical. Some men have taken out a part of the colon and not the whole colon, as Lane has advised, and that is better, anastomosing the ileum to the transverse colon, which is a very much better operation than to resort to the more radical procedure. Another procedure that has been advocated and practiced by me is appendico-cecostomy, which is still in some cases permissible if you get rid of the bands.

Another method is to short-circuit the intestine in a manner I have successfully practiced in some cases. I have seen bad results from a single short-circuiting of the ileum into the sigmoid. The whole colon becomes loaded with material that you cannot get rid of, the back pressure, the reverse peristalsis, filling up the colon solidly. Some years ago I began performing double short-circuit operations on the intestine for the relief of these severe chronic intestinal obstructive toxemias, and I have some of these cases under my observation without any toxicity whatever. I recommend this operation to you because of the excellent results obtained. In one case I anastomosed the ileum to the sigmoid and I anastomosed the cecum to the sigmoid. Why? I wanted to drain that cesspool, and I did it. In another case I anastomosed the ileum to the sigmoid and the ptosed colon below this to drain the colon. By this means you have not only drainage of the small intestine, but you have the colon anastomosed below the first anastomosis, and thereby you get siphonage of the whole colon, draining the material out into the lower intestinal tract.

Dr. Julius Friedenwald, Baltimore, Md.—I should like to emphasize the effect of transduodenal lavage in the treatment of some very severe cases of ileo-cecal stasis. I have used for a number of years Ringer's solution, and have found the solution that Aaron has recommended of 30 grams of magnesium sulphate and 30 grams of sodium sulphate in a liter of water as a lavage daily for ten days very useful. In many of the severe forms of ileo-cecal stasis great relief has been afforded by this method of treatment.

Dr. Willard P. Whittington, Asheville, N. C.—Every physician meets more cases of ileo colic stasis and its constipating effects than any other trouble. We have congenital constipation, we have habitual constipation, we have obstructive constipation, we have inflammatory constipation, and we have all manner of constipations that are caused by all manner of diseases or conditions of the alimentary tract. The causes are legion, and the treatments are likewise legion, varying from the use of salts to all kinds of pills on up to the numerous combinations of a few good laxative purgatives.

Physio-therapy is a new name coined by therapeutists of the late World War, and the methods have certainly had a wonderful influence in restoring our crippled and maimed soldiers and those who have been shot and cut to pieces, have had all manner of good and bad diets, and have been exposed to changes in the weather, etc.

Physio-therapy has taught us that in the treatment of intestinal stasis we should enforce the use of the coarser diets. If we would direct our attention to proper diet with the coarse foods, whole corn bread, whole wheat bread, brown rice, give plenty of green vegetables, milk, and liquid food, and add to them a little physio-therapy in the way of the sinusoidal current, the faradic current and other contracting and stimulating electric currents, with massage and vibration, we

would get rid of a great deal of these intestinal troubles.

Dr. A. L. Levin, New Orleans, La.—I am very glad Dr. Simon mentioned transduodenal lavage. Practitioners are beginning to recognize its value. I want to mention one point in regard to transduodenal lavage, namely, that we should use large quantities of the solution. If we use only 300, 400 or 500 c. c. it is not sufficient. We may just as well give the patient a dose of purgatives. It is essential to distend the intestinal tract so that from the folds of the intestines the large quantities of the fluid (Ringer's or Aaron's) will sweep out infection. We will not accomplish much unless we can stimulate peristaltic action. If there are bands of adhesion we cannot accomplish perfect results. In cases free from intestinal adhesions transduodenal drainage is an excellent remedy. I advocated this method of treatment several years ago in a paper dealing with this subject. I was criticised then. It is interesting to note that the pendulum today is swinging the other way.

Dr. Simon (closing).—In regard to the more frequent implantation of the tubercle bacillus in the ileum or colon, the explanation is rather clear when we consider that the lower end of the ileum and first portion of the colon is the point of least resistance in the bowel. In spite of its great vascular distribution, its relative muscular relaxation and the normal retardation of the fecal current which takes place in that segment of bowel makes it more a local prey for bacterial infection than any other segment of the bowel. I think it is a clinically demonstrated fact that most of our real, persistent intestinal infections take their initial origin in the ileo-cecal segment of bowel. That is true not only of the tubercle bacillus, but likewise of the amebic organisms and hosts of bacterial organisms besides the tubercle bacillus. Our real cases of colitis begin in the ileo-cecal segment of bowel and spread by the natural route of drainage from the ileo-cecal region toward the anus. When they appear in the lower rectal region, it means that a long circuitous route has been traveled through the entire colon.

Dr. Jelks' remarks about the surgical treatment of these cases prompts me to say that on general principles I am opposed to it. I cannot cure Dr. Jelks of his surgical instinct, but I do believe in this condition we ought to get away from the surgical idea. My impression is that the atonic state of the bowel is the primal factor in stasis of the intestinal tract. I am not entirely oblivious to the mechanical side, the possibility of slight interference with the peristaltic movement, but the bowel musculature is the primal factor and you cannot cure that by mechanical measures. The fact that you have sigmoid union still means that you have an atonic bowel to contend with, even though you have short-circuited the fecal current.

I have not been converted to the Lane conception of the surgical treatment of ileo-colic stasis, and I must say for the benefit of our surgeons in New Orleans that even in the early days they were loathe to adopt this rather radical procedure.

THE RELATION OF GASTRO-ENTEROLOGY TO OTHER SPECIALTIES*

By A. W. Calloway, M.D.,
Asheville, N. C.

Modern medicine has been developed in two decades. Physiological chemistry, hygiene, diet and a reconstruction of the poor mode of living have replaced the administration of drugs.

Specialism has been criticised because it has been needlessly abused. It is a result of the growth of general medicine and the utter inability to keep abreast of the whole and the desire to perfect our work and add to our knowledge. One in special work feels the demands of the times and grows because of the inability of internal medicine to meet the zeal for more exact knowledge and because of the desire to render better service in the treatment of diseases of the gastro-intestinal tract.

The vast extent of internal medicine, together with the limitation of one's life work, compels one to select certain fields for his labor. The relation of the gastro-enterologist to other special fields of work can be but of friendly and helpful association in the problems which concern us as a whole. We consult because we either ask for or seek information and help. The time has long since passed when the question might be asked why an internist cannot fill the place of a gastro-enterologist. He could were his years not three score and ten.

A specialist is a physician who, by training, experience and intensive study, has developed a skill which enables him to do better work and, although he has narrowed the attention to certain fields he need not overlook the organism as a whole.

The practice of medicine is an art, to which must be added all the means of technical skill. Try as we may, it will never be an exactly applied science.

A gastro-enterologist is a physician who, by special training and a broad clin-

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ical experience in the general practice of medicine, desires to give his primary attention to the study and treatment of diseases of the organs of digestion. The patients who have been successfully treated really develop the gastro-enterologist and he has become useful to the medical profession because of his intensity of study and application through which he is able to render valuable aid to the ills of the disordered digestion.

Why not be an internist? We are inclined to add to clinical medicine by intensive study all that relates to the proper digestion and assimilation of food. We ourselves can explain this inclination no more than we can explain the affinity of human relations.

An internist is not a gastro-enterologist nor can he fill his place in that his vision is widely generalized rather than specialized. He lacks the intensified interest. There is an ample field for the internist who makes a special study of gastro-intestinal diseases, and he need not, in so doing, divorce himself from general medicine.

Many diseases of the gastro-intestinal tract can be corrected by the surgeon. We should freely, yet conservatively associate our cases with him. We desire to employ all the means of diagnosis and all the skill in the refinement of observation of the treatment of disease, nor should we be lured by the brilliancy of mechanical methods. Medicine is the mother of surgery. Cabot says the chronic appendix is a marked reflection upon modern medicine. Can the mother recognize her own child? There is every reason why the surgeon and gastro-enterologist can consult conservatively and reconsider viewpoints based on tabulated results. The general effect of gastro-enterology on surgery has been to add conservatism and specific information.

Duodenal drainage, refinement of diet, correct living, physical measures, absence of drugging, electro-therapy and hydrotherapy have at least modified the demand for the more spectacular employment of the scalpel. The physicians in the more limited specialties may view the house from one window and we well know their work greatly aids clinical medicine.

The correction of errors of refraction, the removal of spurs and tonsils have their place, but it should not be too easy to overestimate special viewpoints. Brilliant results have followed the eradication of focal infections.

Digestive disorders have been cured, but again these measures are to be carefully considered, for in many instances relief in one does not relieve the other. The mere presence of an infected tooth does not imply that its removal will correct the gastro-intestinal disturbance. A closer personal association rather than a formal report is to be advised where possible. The work must prove the viewpoint and this is frequently done. There is a tendency, too, on the part of limited specialists to feel that the particular focus they find explains the whole pathology. They may lack the broad view which might account for diverse disturbed physiology. Their examinations so frequently do not include the carefully taken history. We must approve of the correction of definite pathology, but add an opinion of caution about expecting too much from a single correction.

The phthisiotherapeutist values aided nutrition highly, and we may be of aid many times in pointing the way to digestive correction both in diagnosis and special dietetic measures.

Forced feeding can be applied only in cases which can accommodate the hypernutrition. Diet means the most food which benefits in all its phase and yet causes no harm. It is the patient who is dieted in tuberculosis and not the disease. Each case should have thorough gastro-intestinal investigation. My experience in tuberculosis is that as a rule there is faulty gastro-intestinal function before the activity of infection.

The urologist can aid us in many cases by his special study of the genito-urinary tract. On the stomach frequently rings the bell. It behooves us to search for the distant disturbances in anatomy and physiology, even should the bell ring loudly. The patient will in these cases overestimate the role of the stomach.

No one considers us narrow enough to disregard a pyelitis when associated with stomach symptoms. A gastro-intestinal

diagnosis means an analysis and not necessarily a conclusion.

The neurologist may feel assured that we will pay due attention to the spastic stomach. Neurasthenia, psychasthenia and various nervous diseases play an important part in gastro-intestinal diagnosis. There are other specialties all of which correlate with gastro-enterology. Many so-called stomach cases really belong to the neurologist, yet a coincident neurotic temperament and a cholecystitis might exist. An association of ideas and facts can determine just which treatment is needed.

The so-called group practice is one which can render combined aid and facilities for diagnosis and treatment.

The extent of the field of work depends on its usefulness. In a large hospital association it would seem very necessary to make divisions of cases based upon the classifications of them. In smaller cities, such as my own, there appears no good reason why a gastro-enterologist should be a part of the grouping of the cases. Personally, I would feel the lack of independence in the choice of work and would have less freedom in the management of my patients. A gastro-enterologist has a field sufficiently large of his own and need not depend upon an intimate relation with other specialties. There are many good reasons for group association governed by local conditions. Any group which can render greater service than by individual effort is not to be criticised. However, I should deplore an association or grouping of physicians which might have a combined fee. A group should not debase the work with a mercenary object.

We gastro-enterologists do that part of general medicine which falls to our inclination. To me our great opportunity lies in diagnosis, reconstruction of disordered lives, but the most important work is in the proper application of diet. Medical literature on this subject has been greatly enriched by the gastro-enterologist.

Dietetics is a wonderful science and now occupies its important part in diabetes, nephritis, hypertension, cardiac decompensation, gastric ulcer, diarrhea, constipation and various food deficiencies. It is one of the most exact sciences in the treatment of disease.

In selecting the subject for the Section, the writer was mindful of just criticism because the topic is not a scientific one, and hence is open to a freedom in personal observation which must be largely formed by individual opinion. I trust, however, it may be met with liberal discussion and wholesome criticism. My defense lies in the fact that it is an honest viewpoint of impressions which have been made from time to time upon one who is intensely interested in gastro-enterology. The wisdom of such a paper is debatable. Should this paper have a single plea, it would be for more frequent personal consultation among the various physicians in special work.

DISCUSSION

Dr. George M. Niles, Atlanta, Ga.—The attitude of the profession in general toward the specialty of gastro-enterology has greatly changed since I first entered the field, which was many years ago. At first, the attitude of internists was that of amused tolerance. Later on, when we occasionally trod on their toes, as we did, they would make a gesture just as you would brush an annoying insect off. We owe a great debt to the internists who worthily fill their place, but the specialty of gastro-enterology has made good and has made a reputation for itself without the help of internists. Only in the last few years have we had whole-hearted recognition from them; but that is coming, and has been gradually increasing, I am glad to say, and now most of them are willing to admit that there is such a specialty as gastro-enterology; that it represents a worthy field of human thought, and it is here to stay, and through its own efforts has attained a successful place in the estimation of the profession and of the public.

As to its relation to some of the other specialties, for instance, the surgeons, we have been able to work hand in hand with them. We feel that we can help them in a way, and they are helpful to us within certain limits. Gastro-enterologists have in many instances curbed the desires and ambitions of surgeons who are too enthusiastic.

Let us take the ophthalmologists. In many instances we have had unusual disturbances of digestion in various ways and have called upon ophthalmologists in cases of dizziness and vertigo and they have been unable to help us. The same with regard to neurologists in cases of neurasthenia and psychasthenia. Let us take the retired business man. He seeks not only the neurologist, but specialists in other lines, and has to seek the services of the gastro-enterologist sooner or later. Urologists are called in to make a diag-

nosis of pathology in the right lower quadrant of the abdomen. Mistakes are made, and we have actually helped to develop that pathologic terra incognita.

Then again, gynecologists have been a help to us, and we have been a help to them.

Take cases of pellagra with protean manifestations that have come under the care of various specialties.

As Dr. Calloway has said, the field is broad. The fact of our studying and practicing a specialty of gastro-enterology does not limit us.

"No pent-up Utica confines our powers,
The whole boundless universe is ours."

We are not limited, and there is no reason why there should be any carping criticism from the other specialties. There is no reason why we should not work with them. "United we stand; divided we fall."

I am asking you gentlemen in this practical field of medical endeavor to lend us a helping hand. Lend us the light of your favoring countenance on a specialty which is rather young and which is still struggling upward. Give us consideration, and the efforts which you extend in our behalf will come back to you. We are not fighting any one. We do not have to fight. We are trying to portray worthily one of the branches of medicine, and we can do it in a cooperative way with you all. All we ask of you is your kind consideration.

Dr. W. R. Houston, Augusta, Ga.—In listening to Dr. Calloway's paper I was reminded of some experiences of my early student days when I hung around the dingy rooms in Berlin where those eminent men, Cohnheim, Boas and Abod, did their work and where I had a kind of inquiring interest in the direction of gastro-enterology, thinking that possibly that was to be my calling. At the moment, however, I am speaking not from the standpoint of a gastro-enterologist, but from that of an internist. As I became increasingly acquainted with the subject of general medicine it became more and more difficult for me to see a sound basis for the separation of diseases of the stomach from the general field of internal medicine. In the first place, there is no special technic that should not be within the mastery of every internist. The skillful use of the ophthalmoscope or the cystoscope demands such long training that it is natural that those who employ instruments of this sort be regarded as specialists. This is not true of anything in the armamentarium of the gastro-enterologist.

In the second place, there is no system which is so difficult to disentangle from the rest of the body as the gastro-intestinal system. It is relatively easy to limit one's practice to diseases of the lungs or of the heart, but almost impossible to limit one's practice to diseases of the gastro-intestinal tract. I soon found that if I were to limit my practice to diseases of the stomach I would be obliged to refer most of the persons that came to me to some one else. The ablest gastro-enterologists tell us that 85 per cent of those complaining of gastric symptoms have no gastric pathology. A man naturally finds it difficult to refer 85 per cent of those applying to him for advice to some one else.

A third consideration that leads us to question the desirability of separating gastro-enterology from internal medicine is the fact that most of the advances that have been made in this subject during the past twenty years have come from roentgenologists and surgeons. So that we are led to wonder whether the most fruitful method of approach to this subject will be through limiting our study to this particular system.

I question the existence of the antagonism that Dr. Niles has referred to between the internists and the gastro-enterologists. But I do feel that most internists would like to welcome the gastro-enterologists back into the fold of internal medicine.

Dr. Tom A. Williams, Washington, D. C.—I have listened with great interest to Dr. Niles' defense of the specialty of gastro-enterology, which does not need any defense, and I got up because of the remarks made by Dr. Houston and because I think the objections to what he has said will come better from a neurologist rather than from those of you who are interested in maintaining the specialty of gastro-enterology as such.

It does not seem to me objectionable for any well trained doctor, who is a good internist, to direct his attention especially and, as far as possible exclusively, to the digestive apparatus.

The digestive apparatus is a very complex functional system. While it is quite true that its reaction depends upon other systems very largely, such as the excretory mechanism, the cardiac mechanism, the nervous mechanism, yet I cannot help thinking that we have had very useful contributions to medical science from men who call themselves gastro-enterologists, and we will continue to have such useful contributions from the kind of men who take a broad view of the digestive system, who learn something about its interactions, who are, in the first place, good practitioners of medicine, and who are not men who interpret the subjective symptoms of patients about the stomach and intestines as diseases of those structures. To think merely of the physical findings that come from the stomach and intestines, and confine the diagnosis and treatment above all to these organs, is antiquated. I think it is that kind of men who give rise to the defense which Dr. Niles attempted and to the stricture which Dr. Houston has made. A body like this, it seems to me, is very anxious to purge itself of men of that type, and the men in this Association are the kind of men who do avail themselves of all the assistance they can get from a knowledge of other things than mere gastro-enterology, and who can collaborate with their colleagues.

While the presenting symptoms or symptom may be gastro-enterological, and the patient's distresses are referred to the abdomen, in reality the source of the trouble may be found elsewhere, as in the excretory or circulatory system, or nervous system, and this is especially true of the nervous system. It has become manifest to

a great many gastro-enterologists, of whom Dr. Niles is one, that functional disorders of the nervous system, even psychogenetic conditions, emotional states, may present themselves so strongly gastro-enterologically as to deceive the practitioner who is not acquainted with that kind of mechanism.

I know Dr. Niles has made strenuous efforts to solve these problems. It is quite true that some of them cannot be solved except by men who have devoted much time and intelligence to neurology, because some of them are very difficult. But I do think the role of functional nervous affections in causing gastric symptoms has become well recognized now by gastro-enterologists. While that is the case, I do not think we can object to physicians who concentrate their interest and attention on the digestive system. What we ought to object to, perhaps, is the tendency that has become strong in late years for the public to seek specialists because it thinks it has symptoms which demand the attention of specialists. We ought to try to use our efforts in directing patients, in the first place, to their family doctor, who will send them to the right specialist if he thinks the services of a specialist are needed. Our efforts should be directed toward that ideal. The tendency of the average layman is to go to a surgeon, to an ophthalmologist, neurologist, gastro-enterologist, or to a laryngologist, which is a bad thing. He may think he has something wrong with his eyes or with his stomach, and the trouble may be found elsewhere. I am not a gastro-enterologist. I am making that statement for you because I would make the same statement to my own colleagues in the Neurological Section. When a patient comes to me because some other patient has told him to consult me, I may find that the patient should not have come to me at all, but should have gone to some one else. If patients are directed to go to the right specialist by their family physician, they are more likely to get the proper treatment. This is an experience or condition we ought to try to correct.

Dr. Calloway (closing).—Dr. Houston referred to the use of the ophthalmoscope. I have not used the ophthalmoscope for some time, but I feel that we should spend a few minutes of our time in becoming familiar with this instrument. Let us take the work of Friedenwald and others. There is a marked difference. There is some difficulty attending the diagnosis of gastro-intestinal conditions. Much depends on the number of cases a practitioner sees. The more cases he sees the more skillful he becomes in making diagnoses and in differentiating pathologic conditions.

Let us take the work on intestinal parasitology. Most of the good papers that have been written on this subject are by gastro-enterologists. A great many patients come to us with stomach symptoms, but something else may have started their trouble. If a patient thinks he has stomach trouble, he will go to a gastro-enterologist, who ought to know whether the case belongs to him or not by right of competence.

Dr. Houston spoke of technical skill. Nine out of ten gastro-enterologists can read gastro-intestinal plates as accurately as roentgenologists. But to acquire that skill and accuracy, takes time and experience. Gastro-enterologists have focused their attention on the conditions peculiar to this specialty. They may not have tried to read x-ray plates of the chest or bone plates, but they do interpret x-ray plates of gastro-intestinal conditions. I think it is only a question of time when Dr. Houston will come to our way of thinking on this subject. A specialist is one who directs a great deal of his energy to a field.

HISTORICAL SKETCH OF THE DEVELOPMENT OF PEDIATRICS IN THE SOUTH*

By E. A. Hines, M.D.,
Seneca, S. C.

Though it may well be said there should be no East, no North, no West, and no South in pediatrics, there are some problems in this branch of medicine in the Southern section of the United States of more than passing interest.

The first pediatric monograph recorded in America was written by a Southern man, Dr. Charles Caldwell, of North Carolina. This contribution was in the nature of a thesis presented to the Medical Faculty of the University of Pennsylvania for the degree of Doctor of Medicine, May 17, 1796, with the following title: "An Attempt to Establish the Original Sameness of Three Phenomena of Fever (Principally Confined to Infants and Children), Described by Medical Writers Under the Several Names of Hydrocephalus Internus, Cyanance Trachealis and Diarrhea Infantum."

Caldwell was a remarkable man, indeed remarkable as a boy, for he knew only the alphabet in his ninth year and began the study of the classics in his twelfth. When he was fifteen he was principal of the Snow Creek Seminary. He was a further honor to the South in that a special chair of medicine was created for him at Transylvania University, Lexington, Ky., in 1819, and in 1837 he was called to Louisville to organize the Medical School, succeeding after four unsuccessful attempts on the part of others.

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*Read in Section on Pediatrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Few will recall that Dr. George Logan, of Charleston, S. C., in 1825 was the first American physician to publish a book on the diseases of children.

He was the first to refer to splints for the correction of deformities of the feet. He wrote the following nearly a hundred years ago:

"When the child cannot be supported by the breast, the food intended for it should be made to resemble human milk as much as possible in all its properties. He should be fed by means of a sucking bottle, or from the spout of a teapot, or some vessel of that kind, a piece of soft cloth being previously tied over it and perforated.

"The child will soon acquire the habit of sucking his nourishment from these. The gradual manner in which it is thus conveyed into the stomach, the pressure of the mouth upon the bottle, etc., in imitation of the nipple, affords time for the necessary flow of saliva, consequently digestion is more complete and the child is not so frequently distressed with griping and pain as when the spoon is employed."

He wrote also that weaning should never take place in April or May, but gave no reasons.

On May 4, 1897, at Washington, D. C., Dr. Samuel S. Adams, in his address as President of the American Pediatric Society, presented an admirable summary of all the important contributions to pediatrics in America. Since this time, however, Southern pediatrics has assumed virile proportions. Much of this progress emanated from the teaching centers of the South, notably Baltimore, St. Louis, Louisville, and New Orleans.

Dr. William S. Booker, of the Johns Hopkins Hospital, was one of the pioneer pediatricians of the South. He had charge of the Dispensary when this great teaching institution was opened in 1889 and later was Clinical Professor in the Medical School. He was a master of the microscope and his study of the bacteriology of the infant's intestine impressed all who followed his work.

The outstanding studies by Duval and Bassett, under the direction of Dr. Knox, at the Thomas Wilson Sanatorium, where the dysentery bacillus was first shown to be the cause of dysentery in infants and young children, deserve more than passing notice.

Interesting and very practical contributions have in later years been forthcoming from the pediatrics department at the Hopkins by Dandy and Blackfan, Howland, Marriott and others.

As a teaching center in Southern pediatrics, Washington University, St. Louis, under the guidance of Drs. Marriott, Veeder, Jeans and others, has not only attracted the attention of students in this country, but from abroad as well. The post-graduate department compares favorably with the schools of the North and East.

Louisville, Ky., developed a number of prominent pediatric teachers as far back as 1874, one of whom was Dr. John A. Larrabee. He was one of the organizers of the Section on Pediatrics of the American Medical Association.

Dr. Henry Enos Tuley and Dr. Philip F. Barbour have also enriched the literature of pediatrics, and have been indefatigable workers for the advancement of pediatrics in the South.

New Orleans has long been known as a commanding medical center. Two men there have especially made their influence felt for better pediatrics, viz.: Drs. W. W. Butterworth and L. R. DeBuys. Dr. DeBuys has been one of the most active pediatricians in the United States from both the organization and teaching standpoint and has also published many scientific articles on pediatric subjects. Dr. DeBuys has done much to advance the allied interests of pediatrics such as organizing the American Association of Teachers of Pediatrics and the American Association of Medical Milk Commissions, and the newly-born service in the hospitals of New Orleans.

Without attempting to point out all the names of early teachers of pediatrics in other schools of the South, it will be of interest to name a few.

Dr. William P. Cornell was a pioneer teacher at the Medical College of the State of South Carolina, and so was Dr. I. W. Faison at the Medical College of North Carolina. Likewise Dr. W. Z. Holliday at the Medical Department of the University of Georgia and Dr. Charles E. Boynton and Dr. L. B. Clark in the Atlanta schools. Both of the latter have contributed to the literature of endocrinology of childhood.

The other Southern states having medical schools undoubtedly have done much to advance pediatrics in the South. Aside from the influence exclusively of medical schools, many individuals, of whom only a few will be mentioned, deserve a place in this sketch. Both Dr. Thomas D. Parke and Dr. J. Ross Snyder, of Birmingham, by pen and voice were valiant pioneers.

In the heyday of ultra-scientific artificial feeding Dr. J. Ross Snyder, the Chairman of this Section, called the attention of the profession of America to the urgent necessity for greater stress on maternal feeding.

Dr. L. T. Royster, of Norfolk, Va., has been very active. He was one of the first to introduce school medical inspection in the South. As Chairman of this Section he coined the slogan, "Better Pediatrics in the South," and thereby gave a decided impetus to the splendid progress made since that time. He was a pioneer in the study of summer heat on infant morbidity and mortality, and he has developed one of the largest and best organized children's clinics in the Southern states.

Dr. William Weston, of Columbia, S. C., was an early writer on hookworm disease and pellagra in childhood. He was the first Chairman of the Section on Pediatrics of the Southern Medical Association, and latterly has aroused international interest by his studies of acrodynia in childhood.

Dr. J. D. Love, of Jacksonville, Fla., the first to specialize in pediatrics in that State, has written several papers which have been widely quoted in the literature, especially his paper on "The Abuse of Drugs in Childhood."

In organization work there are certain landmarks worthy of mention. The organization of this Section is one. The Council approved of the request in November, 1916, and the first meeting was held at Memphis in 1917. From that date to this one of the most vigorous section of any medical organization in the world has never slept for a moment.

Again, in 1918, Dr. William A. Mulherin, of Augusta, Ga., organized in Georgia the first state pediatric society. From this beginning the movement spread rapidly to nearly all the Southern states and bids fair to be adopted all over the United States.

A pioneer effort, not appreciated always, is that of the study of the well child. Dr. Joseph S. Wall, with the aid of Dean J. W. Kober, of Georgetown University, Washington, D. C., erected in 1914 a special building with the end in view of instructing the students in the physiology of the well child.

Orthopedic surgery, so important as a contributory factor in the success of the treatment of the diseases of childhood, has not developed as rapidly in the South as in some other sections of the country. Dr. Michael Hoke, of Atlanta, Ga., has been a pioneer worker of enthusiastic energy and highly successful as the chief of the Scottish Rite Hospital for crippled children. In this connection should be mentioned the recently established North Carolina Orthopedic Hospital, founded by a philanthropic citizen, Mr. R. B. Babington, of Gastonia, N. C., and fostered by the Legislatures of 1919-1921, with Dr. Hoke Consulting Surgeon, and Dr. Oscar Miller, Chief Surgeon.

Children's hospitals and children's wards in general hospitals have not grown with special rapidity in the South, yet there are a few with creditable records: the Milliken Memorial, New Orleans; the Children's Hospital, Augusta, Ga.; the Babies' Hospital, Wilmington, N. C.; and the Infants' and Children's Sanatorium, Saluda, N. C. In certain phases of their activities these institutions have been of pioneer types.

Another pioneer institution of great promise is the Southern Pediatric Seminar at Saluda, N. C., founded in 1921 by Drs. D. Lesesne Smith and Frank Howard Richardson. This Seminar is unique in America, and probably in the world. A group of Southern pediatrists interested in the advancement of their specialty, and in the diffusion of the latest knowledge of children among those who are brought in contact with the most children, have volunteered their services to create a teaching center at which may be presented the latest developments in this most important branch of medicine.

In conclusion it may be emphasized that in this brief sketch of the early days

of pediatrics in the South the writer has had the cordial assistance of not only the older men, but of the younger men as well. Of the latter many deserve special mention for the high order of work they have done and for the prolific output of their scholarly pens.

Finally, at the risk of some reiteration, scientific pediatrics in the South owes a lasting debt to such men as W. McKim Marriott, John Howland, B. S. Veeder, John Zahorsky, P. C. Jeans, and Hugh McCulloch.

DISCUSSION

Dr. Owen H. Wilson, Nashville, Tenn.—Pediatricians do not treat the majority of sick children, and the greatest work of this association has been spreading abroad among general practitioners the knowledge of pediatrics.

Dr. H. Leslie Moore, Dallas, Tex.—Pediatrics is decidedly the most popular specialty in Texas. Five years ago we had only three pediatricians in the State. Today we have ten in Dallas alone. We are well organized and are presenting our papers with the Medical Section at the State Society. The Medical Section each year allows us a half day for pediatric papers. We are doing splendid work in Texas, just as they are in Georgia, Alabama and other states whose precedent we are following.

Dr. L. T. Royster, Norfolk, Va.—I do not want to let this opportunity pass to correct one slip in Dr. Hines' idea of orthopedic work. He does not know what is being done in Virginia. Under the very able leadership of Dr. William T. Graham one of the best orthopedic clinics in the United States is conducted in Virginia. It is partly connected with the Medical College of Virginia and we have a hospital devoted to that purpose. Clinics are held periodically throughout the State in five different localities. I do not know the number of towns represented in each locality. Dr. Graham comes down once a month and sees anywhere from 50 to 125 or 130 in our section. I want to give honor due in that direction. The clinic is partly subsidized by the State of Virginia.

Dr. William A. Mulherin, Augusta, Ga.—I should like to say a word about the Southern Pediatric Seminar mentioned in Dr. Hines' paper. I have the honor of being Dean of this Seminar. It is a two weeks' teaching course in pediatrics, conducted during the month of August, in the North Carolina mountains. It caters to the general practitioner and not to the pediatrician. It teaches the fundamentals of pediatrics and its allied branches by lectures, clinics held on patients from a baby and child sanatorium, and from a baby and child hospital. Also laboratory teaching is given in clinical microscopy, chiefly as it pertains to pediatrics.

Its faculty, or teaching staff, is composed entirely of Southern physicians, chiefly pediatricians. It is their belief that a distinct need exists in the South for this course. They reason that the state pediatric societies in our states teach the general practitioner just enough pediatrics to stimulate in them a desire for a better understanding of the essentials of pediatric practice. That this conception of the situation existing is probably true is shown by the attendance of some 20-odd physicians at the Seminar's course last year.

Applicants for more advanced pediatric work are referred to larger pediatric centers. We have in our Southern territory one of the best of these existing in the country. I refer to the Washington University Medical School, St. Louis, Mo., with its Pediatric Department under the able guidance and supervision of W. McKim Marriott and his corps of excellent assistants.

The Southern Pediatric Seminar is truly altruistic, as every one of the teachers pays his own expenses. If eventually any money is accumulated, it is expressly understood in our organization that the money is to be utilized in welfare work for Southern babies and children. The motive of the members of the Seminar is to help in the very commendable move that is now sweeping over the Southern states for better pediatrics in the South. Their reward is in the conviction of their minds that they are helping Southern babies and children.

GROUP PRACTICE IN PEDIATRICS*

By Frank Howard Richardson, M.D.,
Children's Diagnostic and Nutritional Clinic,
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It has been interesting to observe the growth among pediatrists of the conception that pediatrics is not "internal medicine with an age limit," but something decidedly different from that, and far broader than that. Aside from the limited field of infant feeding, there is really no more reason for dividing internal medicine into age groups than there is for similarly partitioning off surgery, or orthopedics, or dermatology. The conception growing among the more thoughtful element is that the pediatrist must stand as the interpreter of the child to his environment and of the environment to the child. Such a conception is, of course,

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just another way of saying that pediatrics is the general practice of medicine as applied to children. And we know that the field of medicine today is so vast that no one unaided mind can hope adequately to compass it. A practitioner among children, then, must somehow be equipped to furnish council to parents along many lines that are not ordinarily considered medical at all. It is interesting to study how different men have attempted to solve this problem.

The commonest way, perhaps, is for the children's man to believe that he can cover the whole field himself. Many of us are quite willing to admit that we can interpret a drum better than the otologist; that we can remove tonsils and adenoids better than the laryngologist; and that we can diagnose and even treat flat-foot, scoliosis or tuberculous hip with the best of the orthopedists. But this is, of course, taking an antedeluvian view of the breadth of the field covered by each of the specialties today. No one but a superman could bring to bear upon any individual, much less upon such a complicated problem as the child, all that medical science holds for him of diagnosis, prevention and cure.

The hospitals, and perhaps even more flexibly the outpatient clinics, have worked out an interrelation among the various departments, by which any child can receive the benefit of comprehensive diagnosis and treatment by calling in the services of whatever departments are desired by the pediatrist treating the case. Probably some such arrangement exists in every hospital worthy the name.

In private practice, however, where we are paid for our work, we fall, as usual, far behind as compared with the character of the work we do without pay in hospital or clinic. Probably most of us have our favorite consultants in eye, nose and throat and orthopedics; and perhaps an office assistant who can do some simple laboratory tests. But aside from this, our work is for the most part individual and personal. Referring selected cases to certain specialists for diagnosis and treatment, to the hospital for x-raying, and to the clinical laboratory for special tests is still done in the old individual way, with a cost to the patient in time and expense, and a reduplication of record-taking and of new contact making, that has to be suffered, to be appreciated.

One of the disappointments we have all experienced comes as we realize how discouragingly small a percentage of the cases about which we want some outside additional opinion, get this aid for themselves and us when we refer them elsewhere for it. The reasons for this failure are obvious and compelling, though seemingly trivial enough as the mother recites them to us. For instance, she is not quite sure where the other doctor's office is. She dreads meeting a new doctor, and wonders whether the child will be afraid of him. She is not sure of his office hours. She has not a definite appointment with him. There will be a lot of questions to answer all over again. She fears he may charge a big fee,—and so on, *ad infinitum*. In short, she hates to open up a new line of action for herself when it is so much easier to follow along the old line of least resistance and come back to the office she has been coming to, where the waiting room is equipped with things the child likes to play with, and where there is a friendly nurse whom the child knows and likes. Whatever the cause, we fail to get the light to be derived from other sources outside of our own offices, and our results fall short of the ideal by just so much. If, further, a pediatrist is located in a small community and has to rely, as some of us do, upon a neighboring city for getting his special work done, it can readily be realized what added difficulties interpose to defeat this phase of his work. Referring a child to the city for special work, in the small summer community in which the experiment in group work to be described presently was carried out, meant demanding the expenditure of a day's time and nervous energy on the part of both parent and child, plus the expense of a round trip railroad fare or auto hire, luncheon, and incidentals. All this added to the difficulties that we have just considered as defeating reference work within a city proper. In short, referred work, except in emergencies, was practically never accomplished

here; and yet it was general, complete, all-round examining, rather than emergency service, that was most highly desired in this particular field, where acutely sick, emergent cases were in the minority, and where the commonest problem (namely, what was keeping an under-par child from being perfectly well), often called imperatively for outside help in its solution. All these were factors in creating the working pediatric group about to be described.

The first step in our attempt to obviate the difficulty just outlined was to invite two colleagues, one an orthopedist and the other an oculist, to drop into the office to make their contacts with the patients and their first examination there, instead of our sending the patients to their own offices, as had been the custom. To our great surprise we found at once that, whereas before we had been successful in persuading only an occasional non-emergent case to get the special examination desired, now, by making appointments for them to return to our own office, we got practically all of them. So strikingly evident was this that it seemed almost impossible to put off taking the next step, and organizing as nearly complete a group as might seem feasible, to cover the whole field of the examinations commonly desired for children.

The following were asked to participate in the first real group formed, each specifying an hour and day when he could see such cases as might need his services, viz.: an oculist, an orthopedist, a dentist, and an otolaryngologist. (No attempt was made this first year to include a surgeon, a neurologist or a dermatologist, the main idea being to attack the problem where the need was greatest, and that was, of course, to get examinations that parents would ordinarily not consider imperative, and therefore would let slip, unless it were made easy for them to accomplish what was desired.) Mind you, this was not a diagnostic group in the strict sense of the term; for not every patient was examined by every member of the group, nor was there any joint financial arrangement; and of the whole personnel, the pediatrists were the only ones limiting their work strictly to children.

The routine pursued was as follows: every child who came in was offered the privilege of a complete dental examination and charting, according to the method of recording perfected by Thaddeus P. Hyatt, the pioneer in dental prophylaxis, for use in the Dental Department of the Metropolitan Life Insurance Company of New York. The correction of the defects found at this examination was, of course, optional with the parent, and, if desired, had to be done at the dentist's own office; but whether such correction was obtained or not, the knowledge gained by the pediatrists of the exact condition of the child's mouth was most valuable. The desirability of a routine eye examination of every child by an expert, with a refraction in case he found anything demanding this, was explained to every parent. Children whose parents were not convinced of the value of this special procedure were given a routine examination with the Snellen test card, or (if unable to read) with the Evans optotype, as part of the general pediatric examination given every child. If this showed myopia or hypermetropia, expert examination and refraction were again urged upon the parent. Gross ocular defect, or the slightest suspicion or suggestion of squint (either external or internal strabismus) so commonly observed in children when one begins to look carefully for it, and of such tragic import if neglected, of course always called for a complete eye examination and refraction under a midriatic. Suggestive or suspected ears and throats were offered the option of expert otolaryngological review; and of course orthopedic defects called for a similar offer as regards an orthopedic examination.

You will notice so far the omission of two important aids to diagnosis, namely: roentgenology and clinical pathology. For the first, we found that a portable x-ray machine owned by our roentgenologist was quite satisfactory for our use.

The solution of the question of securing the necessary clinical pathology constitutes such an interesting chapter that it deserves a paper to itself. It has been reported elsewhere. Suffice it to say here that in our State a pathologist (Dr.

Harvey P. Barret, of Charlotte) has perfected a laboratory service that is unique, so far as I know. He maintains a central home laboratory in the largest medical center of the State, Charlotte, where he takes young women of good preliminary education and trains them to become laboratory technicians. After a year or two of intensive training these technicians are prepared to do ordinary routine laboratory work under the supervision of their chief. He is thus able to supply several hospitals, medical buildings and associated groups of physicians, with unlimited laboratory service under their own roofs, by equipping each with a very complete little working laboratory, and staffing these branch laboratories with his trained technicians. While he holds himself personally responsible for the character of each bit of work done, he is quite safe in doing this, because his technicians, while trained over a period of months to do routine laboratory work even better than any recently graduated doctor could possibly do it, nevertheless know their own limitations, and send anything at all elaborate (such as blood chemistry, tissue work, etc.) in to the home laboratory to be done by the most thoroughly trained technicians under the eye of Barret himself. On the principle that, if the laboratory is working to capacity, laboratory work can be done at a tithe of what is currently charged for individual examinations and tests, he is able to supply this service at a definite figure per month, irrespective of the amount of work done. This amount is so low that it can easily be met by charging each patient a small blanket fee of a dollar or so, irrespective of how much work has been done in the particular case. Or, if a few of those who are better off financially are charged for their work at anywhere near current rates, this pays for the service for the rest of the cases. By this means every child coming into the office, irrespective of his financial status, in this little mountain town of less than 1000 permanent population, gets as complete a series of laboratory tests as could be asked for in the most up-to-date metropolitan hospital. For instance, the following routine is followed on every child: urine, including microscopic; blood, hemoglobin, red, white, differential, malaria, and if the child is running a temperature, Widal; stool; if coughing, sputum obtained with a long swab; and, if indicated, gastric contents. Where the pain of such procedure seems justified by possible results, a Wassermann is secured. If for any reason it seems desirable, blood chemistry is done.

These are routine, in so far as they can be obtained without upsetting the patient too much. Any further procedures desired (and Barret frequently helps by suggesting something the rest of us would not have thought of) are to be had for the asking, the technician collecting whatever material is necessary, and either doing the work in our own branch laboratory or else sending it in to the central laboratory, if it is beyond her powers or the scope of her equipment. Without some such laboratory service as this the group would of course have been seriously, if not fatally, handicapped.

SUMMARY

The foregoing has been an account of an attempt to give the *private paying* patient, even in a small country community, as fair and complete and scientific treatment as the *free* case gets in the large urban center. Its success must be judged by its benefits to (1) the associated specialist; (2) the pediatrist; and (3) the patient.

(1) The associated specialist has his first contacts with a goodly number of new patients made for him under the easiest, pleasantest circumstances imaginable, with all the disagreeable elements of strangeness, shyness, fear, etc., eliminated by the fact that the child is in a pleasant environment, planned for children's comfort, and already quite familiar to him. Under such circumstances time is saved and the very best work can be done.

(2) The advantages to the pediatrist are equally obvious. He has at his disposal every aid possible for making a complete and correct diagnosis in every case where he feels that his own knowledge of children needs to be supplemented. He gets his reports "fresh;" in fact, whenever possible, he is present at the special

examination, and so learns even more about the child. He is able to coordinate the results and to outline a well rounded regimen for his patient, acting as the interpreter to the child of all the recommendations made by the various agencies brought to bear upon him.

(3) The advantages to the child and his parent are most important of all. First of all, their job is simplified. Everything necessary is obtainable in one place, where the child is at ease, at home, and mentally comfortable. Time, strength and expense are all kept down to the minimum. The difficult task of coordinating and reconciling the findings and recommendations, ofttimes conflicting, of several different specialists, is not left to the distracted parent, but is all done for her by one person, the pediatrist whom she consulted in the first place, and who has not dissipated her confidence nor shaken her faith by shunting her about from place to place to get the data needed to complete his picture. In a nutshell, it has been possible by this means to *offer* to a *self-respecting* family which wants to pay its way, quite as good service as we have been in the habit of *forcing* upon the *free* patients in our city institutions. It has proved practicable in a tiny vacation summer community; and some of its features have already been applied and found helpful in a city of some millions. It is respectfully submitted for your consideration as the one feasible means of treating a child as modern pediatrics demands that he be treated; not medically alone, but by every means in our power that promises to help him attain one hundred per cent health and happiness.

DISCUSSION

Dr. R. C. Spence, Dallas, Tex.—I have tried to practice pediatrics both ways. At present I happen to be a member of a group in Dallas, Tex., similar to the one which Dr. Richardson described. Our group is composed of eighteen doctors with each specialty in medicine represented. We own our own building and each physician in our group has his office and equipment in that building. We call it the Medical and Surgical Clinic. When a child comes to this Clinic he reports at the desk near the entrance and is given a card with the name of each department on it. This is given to the mother. The child then comes to my department, where a routine history is taken and a complete physical examination made. If it is desired that a special examination be made of the teeth and throat, for example, these two departments are checked off on the card and the parts to be examined indicated. If a routine blood, stool and Wassermann is wanted, we check these off on the card and the child is sent to the laboratory. The man in charge of each department writes his opinion on the history sheet. He says nothing to the mother or child. As soon as all the data which is thought necessary is collected the child is brought back to the pediatrician and the situation is talked over with the mother and it is decided what is best for the child. By this arrangement the examination and other work can be made in much less time. The child very often makes only one visit. Another thing we are able to control is the charge. If a mother comes up and says she is not able to pay for all these special examinations, a fee is set for the whole thing. In that manner we are able to do just what Dr. Richardson has described and it seems to me to be the most feasible plan for the practice of medicine, provided there are no weak departments in the organization. If there happens to be some specialist in the organization whose opinion is not good, then, of course, the whole organization will be hurt. If there happens to be a man in the group who thinks he is not getting a square deal, that also has to be eliminated. If it is possible to get together a group of specialists who are good in their respective lines of work, it seems to me that this is the best way to practice pediatrics or any specialty in medicine. There are many difficulties which have to be worked out. If this can be done satisfactorily, there is no question that better service can be given patients; and it is a very much more satisfactory way to practice pediatrics.

Dr. Robert A. Strong, Pass Christian, Miss.—We have to be particularly careful at the present time, especially in group practice, that the patient does not get the idea that he is simply a case. Many of you have heard patients complain that they were given a card in the front office by the secretary, passed along from one man to another till they returned to where they started and paid the last figure punched on the ticket as they would in a well known restaurant. That is what we hear, particularly if they do not get the relief they seek. There is a strong tendency to criticise at the present time, as is evidenced by numerous articles in the medical and lay press. Dr. Frank Billings had much to say in connection with group practice and the passing of the family doctor and a series of articles entitled "Our Modern Medicine Men" appeared recently in the *Century Magazine*. These were unsigned, but I have since learned that Paul De Kruiff, who is or was associated with the Rockefeller Institute, was the author of them. They were certainly opportune and much of the criticism was enough to make you think. In addition to these articles, remember the chiropractor, science healer and now the Abrams doc-

tor, never overlooks an opportunity to grasp this type of criticism to spread propaganda. At any event, it certainly behooves us to be careful not to give the public the opportunity or occasion for this criticism. Group practice offers pay patients an opportunity to secure thoroughly scientific service which, before it existed, was available to a large extent only in free clinics. It is an excellent means of getting at the bottom of things, but we must not overlook the personal side. Mothers expect and insist upon a little personal service, sympathy if you will, a little conversation, a pat on the head, the present of a balloon and the same old things that all of us have done in the past, will still prevent much of this criticism and prevent the increasing numbers from going to the chiropractor, science healer and the Abrams disciple, who gives them pats and balloons and nothing else.

Dr. Charles Boynton, Atlanta, Ga.—I agree with Dr. Strong that the present tendency is to lose sight of the individual patient. When a group of ten or twelve specialists join together there is a tendency for the individual specialist to say, "What is the use of my knowing anything about that; Dr. XYZ will take care of that." There is only one man in the whole group who gets a general survey of the patient and his condition and that is the man who checks up. I think you are liable to develop a great many mechanical technicians in all lines and to lose sight of the patient as a whole.

Why is it that home results are better than hospital results? The hospital patient has the benefit of all the scientific apparatus, etc., and still the patient does better at home. I am speaking of the little patient. Of course, this group practice applies mostly to the so-called office run of our patients. It does not take into consideration the patient as a patient at all. I think we are simply tending toward losing the individual relationship of the doctor with the family.

Dr. Richardson (closing).—The objection often raised that in a group the mechanical side is emphasized and the personal, intimate touch lost, is a very serious one; so serious, in fact, that we did not care or dare to risk it in our work. We have not developed along the lines of an ordinary group at all. What we have is simply two general practitioners for children, reinforced by whatever technical experts they may need in order to complete their diagnosis and treatment of any case that may come to them. The very intimate, personal relation of pediatrician to patient and parent is rendered closer rather than more remote by the fact that the pediatricians can supplement their own inevitable shortcomings by the aid of the best specialists without sending their patients away to other men's offices, and perhaps to neighboring towns, at the great outlay of time, strength and nerve force that this chasing about entails upon a mother with a child. The mothers never fail to appreciate the fact that their convenience is being consulted; while the children, perfectly at home among surroundings specially designed for them, with which they have already become perfectly familiar, are neither frightened nor ill at ease when the oculist or other specialist makes his examination. We have our rooms so arranged as to attract children and interest them; and it many times happens that children cry at *leaving* the office, because they are having such a good time there. The pediatrists remain the center of the group. Their personal contact is strengthened, not weakened, by reinforcing themselves where they need help.

This scheme eliminates one serious fault or weakness inherent in the ordinary group, that there may be a weak link in the chain, in the shape of one member whose work is unsatisfactory. If such a member has stock in the group, it is a difficult matter to replace him with some one better fitted for his part of the work. None of our consultants has any business connection whatsoever. If our way of working things does not appeal to him, he can dissociate himself painlessly. If he does not prove temperamentally fitted for the work we want done, we can terminate the connection just as simply. Furthermore, there is no financial juggling necessary. Also, the fact that a man is seeing half a dozen pay cases makes him quite willing to see as many free cases as may be sent to him at the same session. If he were asked to handle these in his own office it might be quite a different matter.

We believe that the germ of this idea is sound, and that it might be applied not only in children's work, but wherever a man in a small community, whatever his line of work, finds that he needs to do much referring of his patients to other specialists. If the mountains will not go to the learned Mahomets, why not reverse the process? The essential thing is getting the work done, after all.

THE RECOGNITION, DIAGNOSIS AND TREATMENT OF MENTAL DISORDERS*

By W. C. Ashworth, M.D.,
Greensboro, N. C.

My subject is the far-reaching evil influence of the failure of fully appreciating, recognizing and treating incipient mental disorders. Our whole social structure, to a large extent, depends upon the effectual treatment of those who are mentally defective. It is a sad commentary on our boasted civilization that a large per cent of our mentally deficient are languishing in our jails, so-called "county

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homes," etc. The appalling number of inmates of our state institutions is significant because of the fact that it clearly indicates a failure on the part of the profession to diagnose and successfully treat the mental disorder from which these unfortunate people suffered during the curable period of the disease. The medical profession fully recognizes the importance of early recognition and diagnosis of physical disease, whether amenable to medical or surgical procedure, but has not yet been fully aroused to the great importance of early diagnosis of mental cases. If we, as a profession, would exercise the same diagnostic acumen in the diagnosis and treatment of our mental cases as we exercise in our medical and surgical cases, the results would be very materially different.

The mental delinquent is not only a menace to society, but has no earning capacity, therefore is a parasite on his or her family. We must also take into consideration that a mentally incompetent person oftentimes, in fact, generally, disrupts the family, and, therefore, lessens the earning power of those who are responsible for his behavior and conduct. The moral derelict is a dangerous person to his associates and the community, hence the importance of finding the physical cause (most usually focal infection) responsible for his dereliction, since more exact scientific study has shown that at least six criminals out of ten are mental defectives and that the same estimate, approximately, applies to paupers, habitual drunkards and dissolute women. In fact, mental deficiency underlies, to a large extent, our most troublesome social problems. The so-called "half-wits," or moral derelicts, are in effect high grade imbeciles, or, more properly speaking, morons, since their mental development corresponds to that of a normal child of twelve or fourteen years. It will be found, on close observation, that they lack judgment and reasoning power, and, as a natural consequence, their actions are inspired and directed by unregulated impulse. In other words, if untrained and uncared for, the mental defective becomes a criminal, a vagabond, a pauper, or a vicious and dangerous person, a constant menace to the community in which he or she lives.

It is obvious to my mind that the crime wave which at the present time is exciting such widespread and justified alarm in the United States is attributable, largely, to the activity of the high grade imbecile, who, in common parlance, has "gone bad," and is, therefore, a pronounced enemy of society. If, however, the mental defective were wisely and carefully trained during the acute stage of the disease he ordinarily would become somewhat useful to society; or, at least partly self-supporting; or be transformed into a harmless person. The difficulty, however, of the problem of treating this large and increasing class of cases is greatly accentuated on account of the great number of mental defectives who are unrecognized, therefore untreated, during the curable stage of their disease. It is a lamentable fact that they are becoming more numerous every day, since each succeeding generation produces a larger percentage of them, relatively speaking, to the total population. Their defects are markedly hereditary, and, unfortunately for society as a whole, they usually propagate their species very rapidly. It is a well established fact that criminals usually marry each other, therefore criminality is the natural and inevitable offspring. I am reminded just at this time of a statement made by Rupert Blue, former Surgeon-General of the Public Health Service, namely, "A true race of feeble-minded people is being developed among us."

I believe the time is rapidly approaching when every municipal court will have in constant attendance a physician well versed in the diagnosis of mental disorders. The reason for the above statements is obvious if the premises of this paper are correct, since a large per cent of the criminals who are daily arraigned before our municipal judges will be found to be mentally incompetent on account, probably, of some physical disease, maybe focal infection, which if properly treated would obviate the necessity of the municipal judge's passing a road or jail sentence upon the individual. I have often thought of the great injustice—I might say un-

fairness—to the youthful criminal who receives such a sentence, and is, therefore, forced into the ranks of hard and seasoned criminals. If the youthful criminal, instead of receiving a sentence of this sort, were found, after a careful and painstaking examination by a physician who was an expert in the diagnosis of early mental diseases, to be suffering from some underlying physical or mental disease, he would be sent to a reformatory rather than have for his companions criminals and moral degenerates of our jails, etc.

The medical profession is in a position to help our municipal courts in meting out justice to youthful criminals, and thereby to save a large per cent of our mental defectives who at present are being classed as incorrigible youthful criminals. If we, as a profession, fully recognized the danger involved in the neglect of mental defectives, the legislatures of our states would soon enact laws requiring scientific treatment of weak-minded persons. If such laws were enacted and systematically applied they would be of inestimable benefit in reclaiming a large per cent of mentally incompetent individuals.

Shakespeare long ago said:

"Canst thou minister to a mind diseas'd;
Pluck from memory a rooted sorrow;
Raze out the written troubles of the brain;
And with some sweet, oblivious antidote,
Cleanse the stuff'd bosom of that perilous stuff,
Which weighs upon the heart?"

Our state institutions at the present time are fairly groaning under the weight of the burden of undertaking to care for the chronic insane, hence the importance of the early recognition of mental disorders while the patient can be cured. It is well known that their facilities are inadequate, notwithstanding huge appropriations from our state treasuries, to care for a large number of patients whose admission is being constantly sought by their physicians, relatives and friends. The congested condition of the institutions is largely due to the fact that they are filled with the chronic insane who are incurable and therefore little room is left for the incipient cases which might be cured.

A large mental clearing house, so to speak, controlled by experts on mental disease, would save the state much expense. The service of this board of experts on mental disease would save the embarrassment to the superintendents of our state hospitals and private institutions of appearing before the criminal courts where the mentality of the criminal is questioned. The members of the board could pass upon the sanity of the criminal independently of the court room, and in this way the grilling examination by our attorneys and the oftentimes consequent humiliation to members of our profession would be avoided. A recent murder case in North Carolina, in which a prominent member of the profession was arraigned for murder and his sanity passed upon by two leading alienists, has proven conclusively to my mind the necessity of the so-called clearing house for mental cases, whether criminal or otherwise. It is also obvious that such a clearing house could secure admission to state institutions for the insane of such mental defectives as are in need of institutional treatment. We have made rapid strides in respect to the care and treatment of the mentally incompetent as evidenced by our epileptic colony, vocational training for mild mental cases and a home for our congenitally defective children.

We cannot praise too highly the splendid work that is being accomplished by our state institutions for the care and treatment of the insane, and I seldom meet the superintendents that I do not feel disposed to congratulate them for the unstinted service which they are rendering the state and Nation. A very illuminating article, written by Dr. Albert Anderson, Superintendent of the Eastern North Carolina State Hospital, and his associate, Dr. Victor R. Small, appeared in the last month's issue of *Southern Medicine and Surgery*. Every member of the medical profession should read the article carefully in order to combat criticism, if for no other reason, of the management of state institutions for the care and treatment of mental cases.

PNEUMONIA COMPLICATING NEURO-SYPHILIS: CASE REPORT*

By R. M. Pollitzer, M.D.,
Professor of Diseases of Children, Medical College of the State of South Carolina, Charleston, S. C.

Case 26,805.—On May 17, 1922, there entered the Roper Hospital, Charleston, S. C., J. E., a white female aged 5 years. She had vomited violently and repeatedly all day, become drowsy, had several generalized convulsions, and then remained unconscious. On admission she was comatose, very spastic, and had a temperature of 98, pulse 110 and respiration 30, which in eight hours were 106½° (axilla), 140, and 55, respectively.

Physical examination showed dilated unequal pupils, not reacting to light, with lateral and vertical nystagmus. The neck was rigid, but not retracted. Chest showed very rapid shallow respiration, lungs negative, except for scattered mucous coarse rales. Heart was rapid, otherwise negative. The abdomen was negative. The liver and spleen were not felt. Lymph nodes were pea size. Knee jerks were equal and overactive.

The urine on entrance contained 4 plus albumin, 2 plus acetone, 1 plus sugar, 2 plus hyaline and 1 plus granular casts, along with a few erythrocytes. It was acid and had a sp. gr. of 1035. It was obtained by catheter.

The leucocytes on admission at 3 a. m. numbered 20,040; and of 500 cells counted, 82.2 per cent were polymorphonuclears, 14 per cent were small lymphocytes, and 1.8 per cent were large lymphocytes. No plasmodia were found. Eight hours later the count was practically the same, but it gradually decreased to 10,600 leucocytes, 61 per cent being polymorphonuclears and 37 per cent lymphocytes on May 22.

A spinal puncture was done as soon as possible, chiefly for diagnostic purposes. The fluid was almost clear, but a slight web formed on standing. The cells numbered 185 per c. mm., 97 per cent being lymphocytes. No tubercle or other organisms were seen. On May 24, the total count had dropped to 34, of which 93 per cent were lymphocytes. Unfortunately through some error no Wassermann was done on the spinal fluid at this time. On May 21, the spinal fluid with colloidal gold gave the following reaction: 5, 5, 5, 4, 3, 2, 1, 0, 0, 0, which closely resembles a paretic curve. The blood Wassermann on May 23, by the cholesterin, Noguchi, Kolmer and alcoholic methods was 4 plus; and on the 26th, the spinal fluid Wassermann was also 4 plus. (Patient discharged on the 24th.) The ophthalmologist reported the fundi as normal and noted the nystagmus. The x-ray report four days after entrance was to the effect that there were scattered areas of increased density in the right middle and left upper lobes suggestive of lobular pneumonia.

So much for the present of the physical examination and the laboratory reports. Let us here take up the history.

This little girl, who had five well brothers and sisters, was born at full term of apparently healthy parents. The labor was natural, short and easy. Her birth weight was 8 pounds. There was no known exposure to tuberculosis and syphilis was denied. At the age of six weeks it was noticed that she began to waste, while the head continued to grow. She became weak and lost partially the use of her muscles. She slowly improved until the ninth month, when, a wet nurse being procured, there was a marked improvement. She soon seemed more normal, though clumsy. She could hold up her head and say several words. At six months several teeth erupted and more came at one year. She did not walk until she was two. She now goes to kindergarten and is said to be as bright as the other children. At the age of eighteen months she had whooping-cough, and a year previous to my seeing her, chicken-pox. She had never had any convulsions or attacks similar before. Notwithstanding the mother's insistence on the bright mentality of her daughter, there is an admission of considerable clumsiness. Prior to the onset of this illness she was perfectly well. None of the other children had recently had any contagious illnesses.

Because of the sudden onset, the convulsions, the severe vomiting and unconsciousness, a provisional diagnosis of meningitis of a non-tuberculous type was made. However, this was purely tentative, for there were many other possibilities. When I first saw her at 6 a. m. the history, with the urinary and spinal fluid changes, suggested some general infection. There was, however, an oversupply of findings. In four hours a marked cyanosis developed. The pulse became very poor and there were more convulsions. She seemed to be rapidly approaching a fatal termination. Five hours later she was no worse, the skin sweating and the kidneys secreting. The following morning, May 18, she was markedly better, although during the night her pulse had been uncountable and respiration almost ceased. At 12:30 p. m. the temperature had risen to 106.4° in the axilla. After a cold pack it fell to 101° and the cyanosis lessened. The pupils were more nearly equal and there was some slight return of consciousness. Nystagmus was still present. Most of the spasticity had gone and no paralysis could be detected.

For the first time then some changes were heard in the lung. Along the vertebral border of the lower third of the right scapula there was some breathing with a slight bronchial character, but there were neither rales nor dullness. Later that day the child regained consciousness and said a few words indistinctly. Also she drank water. The following day (May 19) there was a definite area of consolidation in the right

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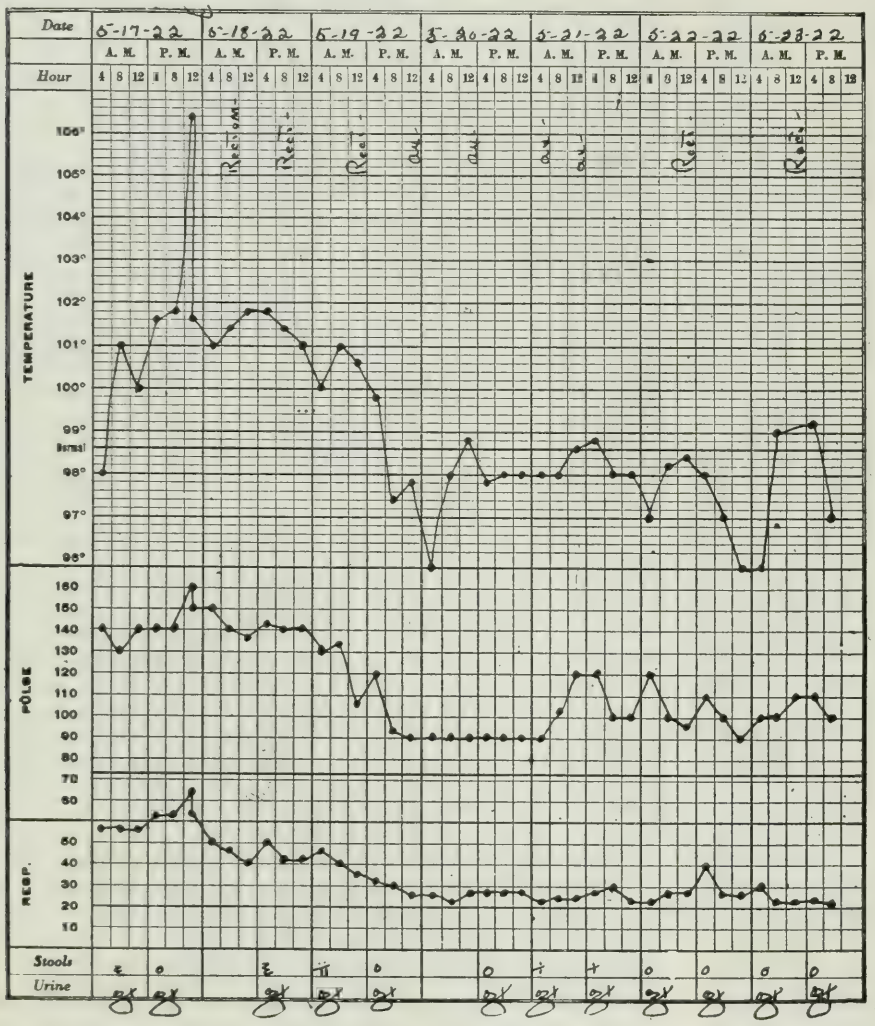
chest posteriorly just below the angle of the scapula. Thereupon the diagnosis of lobar pneumonia was made. By May 20 the patient's general condition was markedly improved. The temperature fell to 96° and soon climbed to 98.5°; the pulse dropped to 90, and the respiration to 24. There was scarcely any inequality of pupils, no strabismus, and no nystagmus. She was eating fairly well and talking rationally. Two days later the leucocyte count was 10,000. In other words, she had recovered from an atypical brief pneumonia just at the time it was discovered. However, she was not entirely well. On May 24 the spinal cell count showed 34 cells, of which 93 per cent were lymphocytes.



Case No. 26,805, Baby J. E.

On May 21 her mentality was good and she was bright and active. On May 23, the luetin and von Pirquet tests, which had been done the preceding day, were found to be negative. The chest was entirely clear. The neurologist who examined her at that time reported that apparently most of the nervous symptoms had disappeared, but felt that a diagnosis of hemorrhage or encephalitis had to be considered. He requested to see her a week later.

Upon the insistence of her mother she was discharged, with the clear understanding that she was to report regularly to the O. P. D. or be treated by her private physician.

Nothing more was seen of her (though fruitless inquiries were made) until she was brought to the pediatric O. P. D. on September 29, 1922, four months after discharge. She looked well and was said to have a good appetite. But she walked with difficulty, being ataxic and dragging the right foot. This disability was stated to have begun three months previously and had steadily progressed. Occasionally when sitting on the floor she lost her balance and fell over. The mother was sure that her mentality was good, but because of shyness it was difficult for a stranger to be sure. The positive physical findings were that the left pupil was larger than the right and both were sluggish. The upper set of front teeth had almost entirely disappeared through caries. The knee jerks were difficult to elicit, but were over-active. Romberg's sign was present. The nose was noted to be distinctly sadlle-shaped and there was a profuse muco-purulent discharge from both nostrils, which had greatly excoriated the upper lip. All these signs were now attributed to syphilis and she was put on mercurial inunctions. She was at this time referred to the department of venereal diseases for the administration of arsphenamin. Even though the father, who accompanied her, seemed to be perfectly willing, she has never returned.

Treatment. — At this place it might be well for the sake of completeness to review briefly the hospital treatment. Among the procedures instituted were spinal puncture several times, continuous proctoclysis of normal salt solution, hot packs and catheterization. Sodium bromid, with chloral, and later calcium chlorid because of the tetany, were given, and on one occasion luminal. Only during the first night was it necessary to administer a circulatory stimulant. Camphor in oil gr. 2 was used. At that time there was extreme cyanosis, very rapid pulse, and high temperature. For the hyperpyrexia a cold pack was used with apparent benefit.

SUMMARY

This report is the story of a girl who became ill suddenly, presenting nothing but signs and symptoms of a primary or secondary involvement of the central nervous system, along with an intense cyanosis. Later the presence of some respiratory disease was suspected and then a pneumonia located. But the pneumonia

was atypical and lasted only four days at the most. After the finding of the consolidation it was thought that perhaps all the nervous involvement was secondary, there being perhaps an encephalitis. This could not have been correct, for it would not have explained the colloidal gold reaction and the positive Wassermann on the blood and on the spinal fluid. On discharge the diagnosis was recorded as pneumonia with luetic encephalitis. Lues had to be recognized because of the serologic report. Encephalitis rather than some other lesion accounted best for the vomiting, convulsions, spasticity, etc., with apparent recovery. Subsequent events tend to prove, however, that while the diagnosis was basically correct, yet enough importance was not attached to the colloidal gold reaction. Inasmuch as there is paresis, with ataxia now, even without any mental involvement, I rather think that tabo-paresis would be more correct.

Although to many this report may seem commonplace, yet it was selected to illustrate how confusing two morbid processes in one patient may be, and because for several days it was a tantalizing diagnostic puzzle.

THE TWILIGHT ZONE OF DIAGNOSIS*

By William Howard Lewis,
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The writer wishes to discuss in this paper certain methods and features in diagnosis which contain potential sources of error and in which relations are often improperly realized. General facts which should be more closely regarded in the study of disease will be reviewed. These principles have been crystallized after the personal diagnostic study of over ten thousand recorded cases at the Mayo Clinic and at the Harbin Hospital. All of these cases were given such laboratory examinations as, in each instance, appeared advisable, and a great number were checked against surgical findings, a most salutory restraint upon any preoperative opinion.

Developments in diagnostic work have led to a system whereby a patient is handled by men in various specialties, more or less associated, of varying abilities, with different attitudes toward and experience in eliciting and interpreting symptoms and of variable skill in assembling the collected data. In many instances these men do not discuss together the cases involved, may not even have offices within easy distance, and do not come into sufficient contact to appraise properly each other's opinions. It is not meant by this to infer that association under one roof is a *sine qua non* or that such association eliminates the above-mentioned errors.

The clinician into whose hands are directed these reports should not be a specialist but rather a man who has personal experience with and current knowledge of the more important specialties such as radiography, cystoscopy and laboratory methods, even, if necessary, being able to perform the ordinary work in these branches. Only by such personal and not hearsay knowledge can he fully appreciate the significance of the findings, recognize sins of omission and commission and pursue the proper investigation.

On the other hand, the specialist is often gifted with an intrinsic myopia which intensifies his vision in his particular field without due regard to certain fundamentals which are beyond his sphere. In too many instances has specializing restricted vision and comprehension, and often as a sequence cerebral inertia has followed rather than the reputed proficiency.

It is for such reasons that a supervising clinician must himself know the value of a report upon a micro-organism, a serological reaction or an x-ray film. Even the leaders will vary in quality and interpretation of work. What one man may see through a microscope or mirror another may not. What one may regard as pathology another may not. Unicellular organisms differ greatly in their activities

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and appearance under slightly variable circumstances and too positive deductions should not be drawn from the multitude of minutiae inherent in the application of bacteriology. The same may be applied to multicellular morphology. In radiology voltage, amperage, distance, exposure, position and development all conspire to affect the picture. As a result, technical reports should be conservatively rendered and judiciously associated with the clinical features. In fact, a reasonable clinical knowledge is not seldom essential properly to evaluate a technical finding. This in no way reflects upon the technical man who will wisely understand the limitation of his work. It is too often the clinician who does not.

This brings up the great variety of laboratory procedures which have been elaborated. Many of these are so extremely sensitive that they react to normal or near normal conditions or are so complex in performance that there are great opportunities for error. Again procedures, born like Pallas from the brow of Jove, are applied as final before their real merits are established. May I venture that, while animal and laboratory experiments are invaluable to medical progress, test tube reactions and what in lower animals may be biologic facts, cannot always be transferred en masse to the genus homo. The laboratory has too often been the master of the clinician and not his servant. But here again by personal knowledge can he appraise its verdict and he will not frequently allow any laboratory finding to outweigh definite clinical symptoms. Albumin and casts do not always indicate nephritis, and a negative urine does not exclude a urinary infection. Lack of cerebrospinal features does not preclude a meningitis, and occult blood does not mean ulcer. The tubercle bacillus does not always indicate a tuberculous lung or kidney, a positive Wassermann does not prove syphilis, optic atrophy does not necessarily indicate renal disease nor brain tumor. Heart murmurs do not all originate from diseased valves. Rales and altered chest sounds may be compatible with normal lungs. A hardened radial does not prove arteriosclerosis nor does hypertension damn a kidney. All amebas do not produce dysentery, the Klebs-Loeffler bacillus is not always diphtheria, a low 'phthalein return does not foretell a fatality, there may be hemiplegia and no evident brain lesion, while stomach tests are so eccentric as to have attained a position of unenviable notoriety.

The text books depict for students the classical symptoms of disease and often the physician does not advance beyond those conceptions. It is by recognizing the earliest suggestions of pathology or malfunction that real triumphs remain to be achieved and the writer is tempted to believe that most of modern surgery is the result of our deficient medicine. Balanced against this problem is that of distinguishing variations of the normal. Here is a large opportunity for error, since only a broad experience with clear analysis can distinguish the range of normal, and quite as great harm may be accomplished in abusing a normal by undue attention as may result from neglect of a real disease.

Organisms differ in dosage and virulence, individuals in resistance and reaction, both general and local. In the appreciat on and interpretation of these facts we must rely upon our intelligence. Pneumonia is not predicated by hyperpyrexia and bronchial breathing. Tuberculous lungs are not always betrayed by sputum, rales and dullness; kidney disease has no constant urinary phenomena; carcinoma in its early stage gives no specific signs; syphilis may not be openly active in its inception or progress; peritonitis does not always cause rigidity and vomiting; hunger pain and hematemesis may result from other causes than ulcer. Awaiting classical symptoms is an attitude of the past. Today we must anticipate them.

In the first decade of this century, the dominion of pathological anatomy over medicine began to diminish and the recent decade has seen that of function ascendant. While the predominance of function over pathology has served the useful purpose of assigning the latter to its proper relation in medicine, it is to be feared that the present incumbent is usurping too

great authority. However, we are learning that function and pathological anatomy are not integral, not always proportional and at times perplexingly at variance. Our profession, after countless experiences with its own overzealousness, never seems quite to profit by past lessons when faced repeatedly by glittering advances.

In logic we speak of premises and corollaries and both must be correct if the deduction is not to be false. In our work this means that too great refinement of technic or reliance upon uncertainly established evidence may entail an unwarranted diagnosis. Wisdom demands firm adhesion to fundamentals and resolute rejection of doubtful secondary data no matter how prettily contrived or ingeniously demonstrated.

As physicians, we have become too frequently set in our values and methods. We are too inclined, at least the more learned moderns among us, to feel that our work is a science and not an art. We are becoming mechanical in our processes and rigid in our reactions. We are forgetting that while the study of disease calls upon many allied sciences and has recourse to exact processes the triumph of diagnosis is intellectual. In the ultimate analysis it consists in wresting from Nature as many facts as possible and then, by the application of pure reason, always guided by the great logicians, experience and clinical judgment, arriving at a specific conclusion. Mechanically perpetrating every laboratory test upon every patient is not intelligent diagnosis if it is good finance and clever advertisement.

A recent review of the comparative values of different methods of diagnosis in one thousand consecutive cases was compiled at our clinic. Each procedure, as expressed in percentages, was dominant in establishing the diagnosis as follows:

	Per Ct.
Physical examination	42
Clinical history	30
Laboratory procedures	11
X-ray	9
Cystoscopy	3
Dental	1.8
Eye, ear, nose and throat	0.8

In one hundred consecutive laparotomies the error of diagnosis as checked by post-operative findings was found to be 3.3 per cent.

There are too many unknown factors in protoplasm and life for us to be arbitrary. The more we think and learn the less do we know. The liver, the spleen, the "silent" areas of the brain, the blood plasma, the psychic activities are all commonplace, but still almost as mysterious as ever. They must enter profoundly into our field, but how often do we take them into consideration? The realm of endocrinology rivals that of mythology. The Ancients, appreciating certain human characteristics, created gods to direct them. The moderns, knowing that there are glands of internal secretion, have hastened to propagate characteristics for them, with frequently as great justice.

We are neglecting what, in war and politics, have been termed "imponderables," the external factors of social problems, family cares, business responsibilities, real or fanciful. In the complexity and competition of life these extraneous influences are primal and stupendous and cannot be calculated by lens and retort. It is the daily monotony, daily care and daily labor which too frequently breaches the human machine and if, in our scientific wisdom, we specify physical facts, we reckon without the springs of human ambition, grief, anxiety, disappointment, mental and physical overload.

In conclusion, let me emphasize that:

(1) Medicine is still an art and diagnosis is an intellectual and not a mechanical process.

(2) Laboratory methods are fallible aids of which the physician should be the master and not the slave.

(3) The clinician should have a working knowledge of the associated specialties if he is to appraise them properly and employ them judiciously.

(4) The mind which has become fixed in its reactions, which has ceased to doubt, ponder and wonder, has passed its meridian.

(5) The summation of a multitude of observations and experiences as expressed by the term "clinical judgment" must be the basis of diagnosis.

(6) The facts of a well developed history, with clean-cut findings of a physical examination, are the sheet anchor of diagnosis.

(7) Too great weight must not be placed upon refinements of evidence.

(8) Classical symptoms must be anticipated and not awaited.

(9) Disease is the expression of disturbed function as well as of pathology.

(10) Much latitude must be allowed for variations from normal.

DISCUSSION

Dr. Sydney R. Miller, Baltimore, Md.—This paper is prophetic of what will be, I believe, the necessary evolutionary process in medicine, namely, a true renaissance of the good general practitioner. Contemporary medicine has been dominated by a deluge of laboratory procedures often of unproved value; the introduction of enormous numbers of instruments of reputed diagnostic precision; and a tremendous growth in specialism. The tendency has been to try to reduce medicine to a pure science, to the neglect of its artful aspects. It would be absurd not to recognize the advancement which these various factors have played in contemporary medicine. The profession, however, has been carried away by the diagnostic craze and too many lack a proper degree of humility in the practice of the profession. The modern period has had a somewhat devastating effect upon the general practitioner throughout the country. Many have apparently come to feel that they cannot carry on their practice satisfactorily unless surrounded by many of the newer instruments or equipped to use a large number of laboratory tests which require both a high overhead expense and at least a certain degree of technical skill. This has produced in many of them an unfortunate self-depreciatory attitude with reference to their importance and value in the field of medicine.

The practitioner in general should remember that he has abundant opportunities for advancing the science of medicine and for its application as an art. He need not concern himself with a great variety of instruments and tests described and exploited in current literature. He possesses a certain number of simple, fundamentally easy technical procedures that are inexpensive, the intelligent use of which will enable him to make a correct diagnosis in the great majority of cases. The general practitioner can add much in medical advancement if he will diligently observe and accurately record the early rumblings or symptoms of disease according to the lines laid down by Sir James MacKenzie. No one has a better chance to advance the therapeutic side of medicine. Finally, no one has more abundant opportunities to study the relationship of personality to disease. If all of these and other obvious things were done, it would go a long way toward ridding the public of a number of cults and false pretenses for the existence of which we ourselves are fundamentally to blame. It is important to remember that sanity and extremes never mix. We are all of us possessed with the faculty of intellect and the instinctive muscles, curiosity and wonder. These as well as our power for observation and logical reasoning can be developed to a state of high efficiency just like other muscles only by regular and persistent exercise.

Dr. Ernest B. Bradley, Lexington, Ky.—The points Dr. Lewis brings out are important and are being emphasized at practically every meeting that we attend. These are, first, the personality of the patient, and second, the importance of a careful history and physical examination.

In our rush for x-ray and laboratory findings to make a short cut to a diagnosis, we often neglect taking a good history or making a careful physical examination. The reason for this, I think, is simple enough. The taking of a careful history consumes a great deal of time. We are all more or less busy. We are in a hurry to make a diagnosis as soon as possible, and we neglect the most important thing of all, the thing which every one can do, whether he has access to a laboratory or not, either because we have not sufficient time or because it is too much trouble. In taking a good history we have to take into account the personality of the patient. It is difficult with some patients to get a good clinical history. A great many questions must be asked before there is brought out the essential points of illness in the past or the beginning of the present illness, the different symptoms, etc. Then, too, the average patient does not answer very intelligently. We forget the personality of the patient in our search for some evidence of organic disease. We do not go into the environment, the surroundings, the business of the patient, his domestic affairs, his financial affairs, the social life, which is especially important if the patient is a woman. We do not get the nervous environment, as it were, and how it reacts on the patient. We are always anxious to make an exact diagnosis of some organic disease. We are afraid to call any condition we know little or nothing about a psychosis or neurasthenia, and yet there are many different conditions that are relieved by simply relieving the patient's mind: by finding out exactly what is worrying him or her. These are the lessons I gather from the paper together with the other point that the clinician must study the diagnostic procedures and laboratory reports. He must be familiar with all the different tests, familiar with all the various laboratory tests, and it is much better if he has spent some time in performing these tests himself. If he has done Wassermann reactions, blood examinations, or bacteriological examinations, he will realize the value of them. The same is true of x-ray films. We cannot serve an apprenticeship in all of the various branches, but during any time that we can spare we should go to the laboratory to see the tests

being performed. We ought not to let any one make a diagnosis for us by laboratory procedures alone without having a doubt in our own minds unless it fits in with the other clinical symptoms the patient manifests.

Dr. David C. Walt, Little Rock, Ark.—As a general practitioner, I take advantage of the very best specialists that I can find as roentgenologists, pathologists and ear, eye, nose and throat men, but control my own patients. It often requires more time than the rest of the work to educate the patient as to the reason why he should or should not do certain things. My system is, usually, to explain to him that each individual is good or bad from every viewpoint, owing to the conditions under which he exists.

Natural law does not recognize individuals, numbers or percentage; it operates only by conditions. The physical and chemical laws that unite to make life are necessarily a multiple influence and not a single value. Consequently, this influence has no respect for wealth, does not consider poverty, does not recognize beauty, hideousness, innocence or crime.

There is a common sense course of reasoning that every practically sane individual must accept from necessity. By following this line of reasoning we become convinced that when we do not get results to a given point it must be from ignorance, accident or neglect. We must admit that one can eat too much as well as too little; then, as reasoning is the most valuable asset we have for self-protection, we must use it to make the demand and supply fit best. We can drain too much as well as too little; we can get too hot, tired or cold. Then we must use our reason to get the highest value out of each day's life.

When people live as though under special dispensation, live from the point of appetite more than reason, drain themselves more than is required, they are not using their best reasoning. Necessity required by civilized law which disturbs natural law, and not compensated for each day, demands a higher price in the shape of abnormality than systematic daily care. It were better to meet requirements from day to day as best we can from the simple fact that natural law operates without regard to individuals or numbers. Then, since every one, even the scientific doctor, lives without reason, or as if he did not have good sense, we cannot expect to make as good conditions for our bodies over a number of years as if we used our best efforts each day.

Men and women who have plenty of weight and strength and are free from aches and pains are considered well, although they have lived by appetite and chance. They have not reckoned upon the fact that reason, care and time would necessarily have built them better than they are built, having eaten because "it tasted good" rather than because they should; having eaten because they wanted it more than because they needed it. They have eaten to please their neighbors or the cook and sometimes have eaten to keep it from spoiling, making garbage cans of themselves and cleaning up only when they had to. At the same time, from the point of necessity of civilized law, they have harnessed themselves in clothes, have been polite in society and wedded to their business, and thereby have made conditions each day from the point of view of governing waste and repair that in forty years must build them bad.

Under my system of educating my patients, keeping them busy caring for themselves every day, giving medicine to effect, feeding to effect, I have reconstructed them from being sick nearly all the time. They are rarely ever sick, but come to the office at stated intervals (rarely ever being longer than a week or two without being looked over). I make a general examination of the pulse, blood pressure, lungs, heart and any other organ where there might be any suggestion of trouble.

I have two patients over sixty years of age who from seven to five years ago came under my care, the first with blood pressure 268, the other 240. A man who is now 65 years old, who was not expected to live long and was incapacitated to care for business, who has scarcely eaten a pound of meat, cereals or eggs during the seven years I have been caring for him, has now good weight and strength, and can do as much work as any laboring man without any special discomfort. His mind is clear, he says he feels better than he has in twenty years, and his looks substantiate his statement. The other patient (a woman) who is sixty-nine, has been under my care for five years, and she, as well as other patients referred to, has eaten practically nothing but fruit, milk and vegetables during this period.

Dr. Lewis (closing).—It is my feeling that the general practitioner has in him the ability to do more good than any other class of men, but in a great many cases he relies on others to do his work.

A point I tried to bring out is that the simple possession of a microscope and laryngoscope does not make a man competent in these particular lines. We have to use along with it experience and judgment.

TROPICAL DISEASES AND PUBLIC HEALTH

SWIMMING POOL SANITATION*

By M. Z. Bair,
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Cities are judged today largely by their educational and recreational facilities and general health conditions, the latter being controlled by the protective measures afforded the public through the activities of a properly organized and adequately financed city health department. The public is realizing that these community activities and facilities are essential to welfare and happiness. Greater demands are being made each year for recreational advantages, particularly for children. Private interests are no longer relied upon to supply these demands entirely, since many cities are providing public recreation centers. In the development of these recreational features, both public and private, the indoor and outdoor swimming pool is playing an important part, as shown by the great increase in their construction, especially in the South, where the period for outdoor bathing is long and climatic conditions such as to stimulate popular interest. Since these pools are used by a large proportion of the population of a community, they may be a potential source of danger to the public health, unless properly designed, constructed and operated. City and state health officials receive numerous inquiries regarding the safety of swimming pools and bathing places, indicating that many people are apprehensive and not only desire but expect control of bathing pools from a sanitary standpoint.

During 1921-22 the committees on bathing places of the Association of State Sanitary Engineers and American Public Health Association compiled data based on questionnaires sent to all eye, ear, nose and throat specialists in the United States and to a large number of dermatologists. Based upon 700 replies, definite information was secured regarding epidemics of mild and acute conjunctivitis, furunculosis of the external auditory canal and other ear infections, sinus infections, tonsillitis, various types of skin infections, several typhoid fever epidemics and one intestinal epidemic. The reporting physicians indicated clearly that these particular outbreaks were attributable or traced to bathing places. Unquestionably there is sufficient evidence to show that certain infectious diseases have been transmitted through swimming pools or bathing places, either by means of the water or suits or towels. There is, therefore, adequate grounds for employing protective measures to safeguard the health of the public. The states of Arkansas, California, Florida, Idaho, Virginia, West Virginia and Tennessee have regulations on this subject and there is rapidly developing a more universal interest.

Proper sanitary control of swimming pools begins with the submission of the plans and specifications for the proposed pool to the state health department for approval. This will eliminate much faulty construction and insure a pool which is capable of proper operation. In the case of outdoor pools, the location should be selected with a view of securing suitable drainage, an adequate supply of water and protection against or freedom from any contaminating influence of the water such as surface drainage or dust.

Design.—Sanitation and safety are the important factors in the design. The size is determined by the probable number of patrons, quantity of water available and whether or not the pool will be operated on the fill and draw or continuous flow, or recirculation basis. The selection of the method of operation depends upon the quantity of satisfactory water available and its cost. In the case of fill and draw pools the California regulations permit an approximate allowance of 800 gallons per bather before emptying and cleaning is required. It is believed by some that con-

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tinuous flow during the bathing hours affords better protection so far as the quality of the water is concerned. The quantity of water flowing through the pool during the bathing hours should be at the rate of at least 400 gallons per bather daily based on average daily attendance. This method enables continuous displacement of the accumulative body contamination and by dilution makes possible the maintenance of a higher degree of bacterial quality of the pool water. The design should be simple and should provide for readily emptying the pool, and overflow outlets should be placed at suitable distances around the pool so as to remove floating material and surface contamination. A curb at least 2 inches high should surround the pool to check surface drainage. The pool walls should be vertical and the bottom sloped not more than 1 foot in 15 feet in water under 6 feet, as provided in the Florida regulations. The walls and bottom should be constructed of impervious material, as nearly white as possible. Walls and area ways adjoining the pool should be at least 5 feet wide, built of smooth hard material and sloped to suitable drains. Dressing rooms, showers and toilets should be well lighted and ventilated and so arranged as to prevent retracing steps from the entrance of natatorium to the pool.

Quality of Water.—Since it is practically impossible for anyone to swim without swallowing some water, the water supplied to the pool should meet the standard of quality for drinking water. It should be clear so that the bottom of the pool can at all times be visible through five feet of still water. It is, of course, impracticable to maintain this bacterial quality after any appreciable number of bathers use the pool. The tentative bacterial limit of permissible impurities in pool waters used by the California State Board of Health is 1000 calories per c. c. on standard agar at 37° C. for 24 hours and a B. coli content that produces gas in not more than half the standard lactose broth tubes inoculated 24 hours with one c. c. of the water. The above is not intended as a safe limit of bacterial impurity, but rather a standard of cleanliness, and future experience may warrant modification.

In the case of fill and draw pools, Florida limits the weekly bathing load between emptying and cleaning periods to 20. The weekly bathing load is the total number of users of the pool in a week, divided by the pool capacity in thousands of gallons. Florida also requires daily disinfection of the pool water, or more frequently if deemed necessary. In the case of continuous flow pools where the water is replaced during use, emptying and cleaning is not required so frequently. There is no general acceptance among sanitarians of a definite schedule of operation, particularly as regards the daily quantity of fresh water to be supplied. A rate of 400 gallons per person per day has been suggested and is in most instances practicable. On this basis an average daily attendance of 300 during a ten-hour period would require a flow of 200 gallons per minute. Where the water supply is limited, or the cost of the water high, it has been the practice to install filters and recirculate the pool water after filtration. Pressure filters are used for this purpose and filtration is usually followed by disinfection in order to insure satisfactory bacterial quality. The filters are designed to operate at a rate of 2 gallons per square foot of sand area per minute, and additional area may be needed for washing filters and emergencies.

Disinfection.—Filtration at the pool and recirculation cannot be relied upon to maintain a satisfactory sanitary quality of the pool water and various disinfecting agents are used to destroy the bacteria. The agents most commonly used are chlorine gas, calcium hypochlorite, sodium-hypochlorite, ultra-violet light and ozone. Where chlorine is used, great care should be exercised in its application to avoid excessive treatment which may irritate the eyes and skin and cause disagreeable odors. The chlorine dosage should be kept at the minimum necessary for satisfactory bacterial reduction. This may vary from 2 to 5 pounds per million gallons of water for the gas and 8 to 20 pounds for calcium hypochlorite or bleaching powder having 30 per cent available

chlorine. Ozone is suitable, but much more costly. Ultra-violet light is being used in a number of installations with satisfactory results. The cost is higher than chlorine, but the question of over-treatment is not involved. Disinfection of the water as it is supplied to the pool can be done accurately and with satisfactory results provided the water is free from turbidity, and not excessively high in bacteria. Disinfection of the water in the pool is difficult and frequently results in over-treatment.

Bathing suits and towels should be washed thoroughly with soap and boiling water after each use and completely dried before being reissued. Common combs or brushes should not be allowed. All persons should be required to take a cleaning bath before entering the pool.

All persons should be inspected before entering the pool and no person having a communicable disease, skin eruptions, eye, ear, nose or throat infection permitted to use the pool. It should be unlawful for any person with a communicable disease to enter a swimming pool when such a person has knowledge of having such a disease.

The management of swimming pools should post in conspicuous places suitable regulations for the protection of the pool water and the safety of those using the pool.

In conclusion, the writer wishes it understood that the foregoing suggestions are made in the light of present-day practice and experience in swimming pool sanitation, about which there is rather limited scientific information, with the hope that they may be useful in bringing about more widespread acceptance of what is believed to be practicable minimum requirements. Further study is necessary and may result in the modification of the present standards, particularly with respect to the bathing load and bacterial quality of pool waters.

THE COST EQUIVALENT SYSTEM AS APPLIED TO LOCAL HEALTH WORK IN NORTH CAROLINA*

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Up to July 1, 1921, the full-time county health work in North Carolina was developed on a cooperative basis in which the State Board of Health exercised a highly centralized form of control. Contracts were made which demanded compliance with a certain set program of work; funds from all sources were pooled in the State Board of Health and redistributed to the counties by monthly checks to cover current expenditures; and health officers were permitted to be employed only with the approval of the State Board of Health. The whole system smacked strongly of paternalism, which created a spirit of dependence by the counties upon the State Board of Health for the progress of local health work. When successes were accomplished the State Board of Health sometimes received part of the credit, but when failures occurred the State Board of Health always received the entire blame. As the expansion of local health administration became greater, this burden of responsibility upon the State Board of Health began to assume disturbing proportions. The State Board of Health, therefore, sought relief from this situation by a system designed to decentralize responsibility for local health progress, at the same time retaining a directional influence.

The way open for this purpose was indicated by the fact that the State Board of Health was offering financial subsidy to each full-time cooperative health project. By making this subsidy conditioned upon the amount of constructive work done, the State Board of Health would thus secure its object, regardless of the machinery and methods employed. It was with this purpose in view that the so-

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called cost equivalent system was developed, which finds its first practical function as a means of measuring work performed rather than indicating its intrinsic value.

It is assumed that each item of health work done costs something, and that likewise each dollar invested in health work is expected to purchase a certain amount of accomplishment. The problem, therefore, is to fix as accurately as possible an estimate of the number of units in each item of work that can be purchased per dollar. For example, let us suppose that in the health budget $100 is set aside for smallpox vaccinations. How many vaccinations could be made with this amount of expenditure? Should experience show that 500 vaccinations could be made by this investment, then it is obvious that the unit cost per vaccination is 20 cents. In developing the scale of unit costs, the accumulated experience of several years' work among many different counties was drawn upon in order that the cost values ultimately fixed would represent not specific, but general or average conditions. One of the first principles found necessary to adhere to was to eliminate, so far as possible, those items which serve only as means to an end, and to place the emphasis upon the end accomplishment itself. For illustration, the fact that no account is made of educational work in the report form does not at all signify that the State Board of Health considers it worthless. But, the purpose of educational work is to get results in the various phases of health work on the program. Effective educational work will increase the output of constructive work for which credits are assigned, while ineffectual work will not. The credit, therefore, for educational work is realized in an indirect manner, but is directly proportional to the effectiveness of the educational work done.

The great mass of public health activities was eventually condensed into a list of items representing as nearly as possible definite end results for each of which items approximate cost values were determined. By means of this scale of values it is easy to translate the report of a health department for any given period to a single composite cost item. For the sake of illustration, let us assume that the scale of cost values assigned is exactly correct. Then we should expect a health department to produce cost credits, whose total should be at least as great as the amount of money spent during the period in doing the work reported. That is, every dollar spent in doing health work should produce at least one dollar in cost credits as a return on the investment. But from a comparative standpoint it makes little or no difference whether the scale of cost values as a whole, or in any portion, is too high or too low. The standing of each health officer with respect to his fellows is estimated by the amount of his earning per dollar above or below the average earning of the group.

It will be noted that the total cost credits produced during any given period is of no significance at all unless considered in relation to the money spent in securing such credits. A health department which produces $5000 in a year on a $5000 investment has twice as good a rating as one which produces $10,000 in cost credits on an investment of $20,000. In the first case, a normal amount of work is accomplished, while only half as much is done in the second case as the people of the county had a right to expect for the money spent. But let us suppose that the work done on the $20,000 investment amounted to $30,000 in cost credits. Then the county would have received 50 per cent more work than was normally expected.

Above all things, however, we must be guarded against a confusion of cost values and preventive values. The system under discussion deals only with the former. While the cost of vaccination against typhoid fever per person may be but 50 cents, the individual thus immunized may be spared an attack of typhoid which might result in death. It is therefore obvious that the preventive value of the many items of health work is out of all proportion to the cost involved, and there is in fact no possible way of correlating these two factors, and no attempt is made to do so.

If the general idea as to what is meant by the cost equivalent system and how it

is derived has been made sufficiently clear, we shall proceed to a consideration of how it is made use of in actual practice. The report form carries, in a column after each item, the fixed unit cost credit which has been assigned to that specific item. The total cost credit for that item is found by multiplying the number of units reported in that item by the unit cost credit. For example, 500 smallpox vaccinations at 20 cents each amount to a cost credit of $100. In like manner, each item is evaluated in terms of cost credits which are totaled for the month. A ratio is then formed between this total and the amount of money spent during the month, the latter being used as the denominator. This then becomes the health department's efficiency rating for the month, or whatever period may be under investigation. Supposing the total cost credits produced for the period are $600 and the money spent in doing the work reported was $600, the ratio is 600/600, or 100 per cent. If only $500 in cost credits were produced on this same expenditure, the rating is 500/600, 83 1/3 per cent. If the cost credits should exceed the expenditures, as, for instance, $700 on a $600 investment, the rating would be 116 2/3 per cent. These ratings, as ordinarily stated in terms of earning on the dollar invested, would be $1.00, 83 1/3 cents and $1.16 2/3, respectively.

At the end of the year the rating of a county for the twelve months' period is used to determine the amount of State funds to which the county is entitled.

The State Board of Health contract with each county pledges a maximum of $2500 per year from State funds toward the local work. This money, however, is paid in accordance with the earning capacity or rating of the county health department during the year. Should the earning per dollar be $1.00 or more, the full amount of $2500 per year from State funds is paid to the county by the State Board of Health toward the local work. But if it should be less than $1.00 per dollar spent, the county is paid accordingly. For example, let us suppose the earning per dollar to be 75 cents. Then the State Board of Health would pay the county 75 per cent of $2500, or $1875.

The State pays for work accomplished, rather than for the promise or prospect of such accomplishment, or in other words for the product of the machine, rather than the machine itself. This being the case, it becomes a matter of serious financial concern to local authorities to make certain that the work being done is up to such a standard as will enable the county to secure the full amount of the State's funds. By this means the influences of local politics are reduced to a minimum, since it is efficient service rather than office holding that entitles a county to State subsidy, which is to say that efficient service is actually cheaper than inefficiency. The mere office seeker is rarely interested in a job where he knows that his tenure of office is entirely dependent upon results which can be quantitatively measured. But should he be bold enough to undertake such a job, the responsibility and penalty for failure rest upon the county and not the State Board of Health, as the county is the sole loser in the game. The State Board of Health is therefore secure in its decentralization policy. We can and do allow the county free exercise of its own choice as regards the selection of a health officer or the plan of work to be pursued. This does not mean, however, that the State Board of Health holds itself aloof. As an expert machinist, the State Board of Health must and does take a hand in the capacity of a friendly adviser. But in so doing the county is under obligations to the State for gratuitous services rather than pressing a demand upon the State to fulfill contracted obligations.

Another very practical significance of this system is the fact that it dissolves the host of variable quantities existing between counties, so that the work of one health department can intelligently and equably be compared with that of any other. The size or wealth of a county, or the amount of appropriation and personnel, are of little or no importance. The only consideration is the use of talents provided. Likewise the type of problems existing in different counties is no bar to comparison of the output of work. During any given period one county may do only school work, while another does only typhoid vaccination, and still another con-

centrates on sanitary work or something else. With a given amount of energy expended, regardless of the item or items upon which it is expended, the same result should be produced when translated into cost credits.

Right here I may explain, however, that in the strictest interpretation the cost credits assigned to items of work are not necessarily true cost values. In making up the scale of cost values it was recognized that certain lines of work were more important from a public health standpoint than others. In order to stimulate a regard for the proper relative value of certain items with respect to others, the true cost values were abritrarily increased or lowered so as to place a premium on certain lines of work and discourage others. For instance, among public health nurses there is a tendency to give undue attention to bedside nursing. To resist this tendency by official order might precipitate controversy and in the end accomplish nothing. But by reducing the cost credit for this item of work it becomes an unattractive line of pursuit.

The cost equivalent system furthermore places the health officer upon his own responsibility. The list of items included in the scale of cost values is rather extensive and may well be likened to a hotel menu card. No one attempts to eat all the things on the menu, but the number of things from which he may choose is great enough to offer something attractive to every man's appetite. And so, also, with the cost of equivalent schedule, the health officer is free to choose any combination of items to form his program at any given time. If he falls down his failure is not due to dictation from the State Board of Health, and in the elimination of inefficient men the personal element is dispensed with. The figures alone furnish the evidence which the inefficient cannot contest. Inefficiency convicts and condemns itself. On the other hand, the system places a premium on the man who can make good, since the county cannot only receive more service from such a man, but can do so at less expense than is required for the man who fails to make dollar for dollar on the investment.

And finally, the feature of the cost equivalent system which must make a strong appeal to every health worker is the fact that it greatly simplifies the task of securing appropriations, for two important reasons:

First, it enables the health department to display its wares in terms intelligible to the public, which is to say that it makes possible an enlightened local public sentiment.

Second, it furnishes a means by which appropriations may be safeguarded. Locally it serves as a constant indicator of inefficiency, which permits the early elimination of the unfit, and in the state government the legislature can be guaranteed absolutely a certain minimum amount of work for every dollar expended.

The system which has been described went into active operation on August 1, 1921. It was a rather heroic undertaking to make such a radical change without mishap. There is always a considerable amount of inertia against a change of any kind. A certain amount of misgiving prevailed in the minds of the health officers, perhaps without exception. But, they were good sports and took the chance gracefully. In spite of the extreme financial depression the county health system has continued to grow and prosper. Not a single county has fallen by the wayside, but instead six new counties have been added. The men of recognized efficiency have kept on being efficient, while four of the weaklings have eliminated themselves.

It would afford a very interesting study if it were possible to include in this discussion a complete report of the work done under this system for some given period, but this would be thoroughly impracticable. However, such a report covering the period from January 1 to June 30, 1922, may be found in the North Carolina State Board of Health Bulletin for July, 1922, copies of which I have for distribution. With reference to this report, it will be noted that the earning per dollar invested

averaged $1.42. The individual earnings are as follows:

1.	Rowan	$1.88
2.	Bladen	1.79
3.	Cabarrus	1.74
4.	Cumberland	1.71
5.	Wake	1.61
6.	Sampson	1.59
7.	Halifax	1.58
8.	Granville	1.56
9.	Pitt	1.44
10.	Forsyth	1.42
11.	Robeson	1.41
12.	Davidson	1.40
13.	Wayne	1.37
14.	Surry	1.33
15.	Lenoir	1.28
16.	Bertie	1.23
17.	Craven	1.23
18.	Columbus	1.20
19.	Edgecomb	1.20
20.	Mecklenburg	1.15
21.	Vance	1.10
22.	Northampton	1.08
23.	Wilson	1.08
24.	Wilkes	.75

Average $1.42

Ten counties made the average or more, while fourteen were below. All, however, were above par except one. In this case a special communication to the County Board of Health concerned, laying the facts before them, was sufficient to get results. The output of that health department has more than doubled since that time.

It should be pointed out also that the high ranking health departments are not necessarily the ones with most money to spend for personnel. Four of the first ten counties in the list have only a health officer, without assistance other than office clerk, while eight of those below the average have nurses and sanitary inspectors.

It is not considered proper to close this discussion without describing the difficulties met with in its operation.

First, the items as set down in the report form are in many cases subject to a variety of technical interpretations. This was recognized in the very beginning and measures were taken to forestall this difficulty by the preparation of a list of official definitions as to the exact interpretation to be placed upon each item. Even after having done this, however, the definitions are occasionally found inadequate to preclude the claiming of credits which we consider unjustified.

Second, the health officers frequently have to do things for which no credit item is allowed, and we are consequently urged to expand the list to include such items. In case such items are unimportant from a health standpoint, as they usually are, it is necessary to stand out against their addition to the list. But this is a help rather than a hindrance to the health officer, as he is thus in a position to discourage the demand for unimportant work, by stating that time spent in such work deprives the county of its claim to State funds.

Third, there is a tendency among the weaker brethren to strive for credits, disregarding somewhat the broader aspects of the job. This is combated by increasing as far as possible the more constructive items at the expense of the less important ones and also by supervision and advice from the State Board of Health.

Fourth, perhaps the greatest problem is that of checking up. A set of record forms is in use, which are designed to make it extremely difficult to cover up any irregularities in the amount and character of work claimed. It is understood as a part of the agreement with the county that these records shall at all times be subject to inspection by the State Board of Health. It is a routine procedure on the part of the State Board of Health representative in visiting a county health department to look over his records and check them against his report. Absolutely no credit is allowed which is not supported by a record in due form. When it is realized that State funds are to be paid on the basis of the local records, it will be understood that the accuracy of these records is a matter of serious importance. In addition to the periodic examination of records, the policy which we believe to be the best solution of this problem is to make an official checking up of the records of each health department at the end of the year. Now, it is obviously impossible to verify every item recorded, but a limited number of items are selected at random and verified. This number will ordinarily be from 50 to 100. The entire volume of work for the year will then be rated in accordance with conditions found in the sample.

The foregoing difficulties have been described in order to show that we do not consider the cost equivalent system perfect by any means, but from our experience we are convinced that its defects are positively overbalanced by its beneficial effects.

DISCUSSION

Dr. W. S. Leathers, Jackson, Miss.—The plan of evaluation of health work which is described in the paper of Dr. Miller represents certain fundamental principles quite important in securing efficiency in public health work.

There can be no question that the plan has merit, but it appears to me to be somewhat cumbersome and difficult of application. One of the chief objections to the plan is that it places rather too much emphasis upon the evaluation of a man's services from a strictly financial point of view. It is necessary for considerable effort to be made at times in initiating health work before there is any tangible way of estimating the result achieved. It is, however, frequently true that such effort is necessary and leads to the result desired.

It is desirable to express confidence in the men who are engaged in public health work, to expect of them certain results and to indicate those results by any method that may be feasible from the standpoint of administrative responsibility, but not to have a system of evaluation upon a strictly commercial basis. In other words, it would appear to me that this plan would react upon the morale of the men doing the work.

Public health work should be done upon a business basis, with due regard for economy and with due regard for measuring the results obtained on the basis of the expenditure incurred, but in doing this would it not be possible to have scale evaluation such as has been indicated without making it the basis of organization, and also to avoid a too strict application of its use in public health activities? A system which is somewhat flexible from the standpoint of the principles involved would be best.

Dr. Roy K. Flannagan, Richmond, Va.—The cost equivalent scheme is in the experimental stage and is entitled to consideration on its merits, not on our feeling for or against it. We should be open minded about it. Dr. Leathers is probably right in not accepting it yet, but at present it seems that his position is colored rather by his feeling than by the facts of the case.

All public health men know how desirable it is and how hard it is to find an adequate measure for the work done in disease prevention. If the figures given mean what they are said to mean, then a valuable contribution to public health practice has been made. If they do not, and I confess with Dr. Leathers to a strong suspicion that they do not in every case do this, then it becomes within our province to suggest wherein the plan is faulty and, if possible, improve it or, if we wish, reject it altogether.

Dr. Miller (closing).—It is altogether possible, if public health workers take sufficient interest in some idea of this kind, to develop what Dr. Leathers has just mentioned.

Dr. Flannagan.—How much money do you give to your counties?

Dr. Miller.—$2,500 per county. Dr. Rankin and I felt like Columbus sailing the uncharted seas when we put this system into action. Everybody had apprehensions. The results that we have had speak more loudly than anything we may have said. We have not lost a single health officer whom we wanted to retain. We have, on the other hand, been able to eliminate several we did not want, and to do it very easily.

There is one thing which I had not anticipated in the outline of this system, but which I find to be the experience and testimony of health officers generally. It furnishes them something intelligible and more or less tangible to which they can point as evidence of their work, and for that reason it is a source of satisfaction to the health officer at the end of the month.

Dr. Leathers referred to the use of the word "paternalism," and I feel just as he does regarding that word. Perhaps the use of the term is somewhat out of place. The system we have been following heretofore had some of the elements of paternalism because we were handling the county funds.

The former procedure took away from the counties any very definite and close contact with the management of affairs.

Now as regards the central agency's having something to do in the control of public health work, I agree with the ideas expressed, but I want to point out that the cost equivalent system really gives the state board of health a stronger grip on local conditions than it has ever had before. It appears to the public that we are throwing everything into its hands. We are able to develop a greater sense of responsibility in the local communities than they previously had. But central control is still realized in a very potent manner, by reason of the fact that state funds are paid out only in return for certain definite accomplishments.

THE RELATION OF THE PUBLIC HEALTH NURSE TO THE ALL-TIME HEALTH DEPARTMENT*

By P. E. Blackerby, M.D.,
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While public health nursing has been discussed prominently in recent months by Freeman and others, there has been no attempt to fix standards for service in definite local units. In Kentucky, we have had a varied experience in securing proper adjustment between the public health nurse and her co-workers on the staffs of our all-time health departments, and we would like to have the subject discussed for mutual enlightenment. To an appreciable extent, public health nursing is an outgrowth of visiting nursing, and the latter service during the years just preceding the World War was carried on without any routine program or definite standards. Various welfare agencies sponsoring the work of the nurse were prone to direct her activities along the lines of social relief, associated charities, bedside care, home economics and various other departures related to benevolent service that kept her so busy she had little time to devote to fundamental public health work were she either inclined to or properly trained for it. Nor is this said to detract from the importance of the services rendered in the capacity of visiting nurse, for after all is said and done, the seed sown by this worker in her former broad field of endeavor has borne fruit in such an abundance of public sentiment for public health agencies that sufficient trained workers are not available for the harvest.

The evolution of the visiting nurse to the public health nurse has not taken place without a considerable lack of adaptation, and in fact may be said to be far from complete. Many of our public health nurses today are in the position of having swapped horses in mid-stream, without being aware of the current, and are finding themselves frequently in trouble while getting adjusted. The nurse was so busy answering the calls for bedside relief and purely social service, and she sensed the popular demand for this in such measure, that simply under a new guise, and without any particular change of environment, her orientation is naturally going to be slow. The popular demand for the visiting nurse is still there, and no matter how keenly desirous she is to be effective as a health worker, the old habit of answering the sick call and ferreting out the social tragedies still stirs her imagination. To adapt this class of workers to a constructive, modern health program is difficult but of course not impossible. Their knowledge of the public and a sharp acquaintance with varying social conditions make of them a valuable asset to the staff of a health department that has constructive, tactful leadership. The other class of public health nurse, the product of the school of public health nursing, comes into the field as a rule with the purely public health ideal (although some, with previous visiting nurse experience, are not altogether committed to the new relation). But it should not be difficult for these trained workers to become adjusted to any kind of a health program.

In order to fix properly the status of the public health nurse in her relation to the all-time health unit, it is essential to recognize the legal background of that organization. In most states the law provides for a board of health made up in the main of physicians and gives that body the power of selecting a physician with acknowledged training in preventive medicine to serve as health officer or director of the unit, and prescribes certain duties for him to perform. These largely consist of law enforcement as related to health, surveys of conditions that affect the public health, various analyses of water, foods, etc., school health programs, publicity, and health education. For the carrying out of these duties he is provided with a limited staff of assistants, and for their activities and conduct is held entirely responsible. Knowledge and appreciation of this responsibility by the various members of the staff should obviate

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the necessity of any misunderstanding. In the personnel of the unit are usually included one or more public health nurses, who are recognized generally as among the most vital factors in the success of the unit. To evaluate and properly develop this service is one of the most important functions of the health officer. To understand and appreciate her relation to the director is necessary if the nurse is to contribute a full measure of helpfulness in the work. She must understand that, primarily, she has been employed to assist in carrying out a definite health program, and that whatever activities fall to her lot, she should be conscious of her obligation to do each piece of work well, with the view of contributing to the success of the organization rather than rivaling the efforts of another member of the staff. Freeman says:

"The recognition of the proper sphere of the nurse's activity so necessary to sound development depends less on a jealous insistence upon her prerogatives than upon efficient and fruitful service within that sphere and upon a resolute determination not to attempt to invade that of the physician, the social worker or any other of the variously trained personnel necessary to carry on the very difficult and complicated business of health administration."

To be an assistant in any worthy undertaking is not an inglorious position, and the individual who gives the best there is in him for humanity's sake rises above mere position and finds his glory in the success of the enterprise. To succeed as the leader or director of any such worthy enterprise one must know the quality of his assistants and be prepared to accept and make use of their helpful suggestions. With these premises, we want to suggest some standards for a proper coordination of the activities of the health officer and his public health nursing assistants.

We believe that except in a unit large enough to employ four or more nurses, a supervising nurse is not essential. The health officer can, without unnecessary loss of time, direct the activities of a few nurses and better coordinate their work in keeping with a definite program, and this with less chance for friction or misunderstanding. A division of responsibility in a very limited personnel is almost sure to result in an embarrassing situation to the unit and one which may seriously affect its success. We have seen this happen more than once and have reached the place where we deplore the necessity for any such arrangement. In larger units, however, where sufficient nurses are available for assignments to special detail work, there is just reason for having a trained supervising nurse to whom they may look for advice and direction, always keeping in mind that in any matter of policy affecting the relationship of the department to the public or to any class group she must always consult with her health officer. The nurse, either under the direct supervision of the health officer, or carrying out the instructions of a supervising nurse, should be given as wide a latitude in doing her work as is consistent with the importance of her duties. It has been said that failure to recognize and encourage the creative impulse in those who work with and for you has resulted in limiting the success of any undertaking. The health officer must have generalship and that of the right sort. He must know his field of operation, the best point of attack, and just which force he can use to the best advantage. Each member of his staff should be consulted frequently as to conditions prevailing in his or her range of activity, and he should never, through a sense of false pride, or to cover up his own lack of knowledge, be averse to accepting suggestions. There are a great many important phases in health work to which the health nurse is adapted both by Nature and training, and the health officer should recognize this and so arrange his program as to insure the progress of her work with the least handicap possible. In his relation to this work of the nurses that is not directly associated with his daily routine, he should be sufficiently familiar to evaluate its worth to the general program and be aware of the conditions from which any criticism might arise. To illustrate this point: the nurse is often criticised in her relations with the family by physicians who, for some reason or other are inclined to see an intrusion on their rights. If the health officer is in ignorance of this it may result in a resentful attitude toward the department,

whereas if the medical profession knows that the health officer is familiar with the activities of his nurse, they can go to him with assurance of proper adjustment. Both the medical profession and the public should be aware of an understanding relation between the health officer and his nurses, that the work of the nurse is linked up with the health department program, and that for her every activity the health officer, as director, assumes full responsibility.

This should hold good in all instances, whether the nursing service is financed by the health department directly or is made available from some voluntary agency. In this connection it is important that any outside organization assuming financial responsibility for any part of the nursing service should look to the director for information as to its success, and through him receive all reports. And, further, we believe that under these circumstances the nurse should be known always as the health department nurse and not carry a title reflecting the organization sponsoring her services. All representative welfare agencies in this country contributing to the advancement of public health are committed to the all-time health unit, and, with only a few exceptions, are insistent when cooperating that their identity be submerged in the health department. This should be the universal practice. The nurse should be encouraged to catch the vision of a definite and permanent health program in the county and to work to the end that the people recognize and appreciate its importance as a necessary part of the county's government. I do not believe that this has been sufficiently emphasized in the training of this class of health workers. They have rather caught the vision of a service distinct and separate in its adaptation to the public welfare. All health officials recognize its importance and heartily welcome this service to the health program and yet too frequently lack the ability to coordinate it properly. There should be provided in every health department a definite program, written or printed in large type, posted conspicuously in the office, and changed each week to conform to the conditions that vary according to the needs for different activities. This assures an orderly deportment on the part of all assistants and keeps them linked up with the directing executive. Just what duties are to be assigned to the nurse should be determined by the director, but not without due recognition of her right to make suggestions as to what particular phase of the work she thinks should be stressed.

We do submit, therefore, that the attitude of the health officer to his nurses, both directly and through the supervising nurse, if one is necessary, should be uniformly respectful at all times, and sympathetic toward any suggestions or recommendations for improvement in plans or methods affecting the routine of activities. He should include in his schedule a weekly conference with all members of his staff and invite discussion of plans and the offer of suggestions. He should invite various members of the staff to read reports of their activities before the meetings of the board of health. With such a basis for mutual understanding, he will merit the confidence and support of his associates in the work. In this connection, we would emphasize that, from our observation, any health program carried out in a haphazard manner, with either lack of constructive leadership or a proper coordination of effort, is sure to result in a setback for the work. To work without a definite weekly program, with each nurse or assistant assigned to whatever activity the time and conditions demand, is sure to invite difficulties. With such a weekly program and a list of standing orders to govern her work, the nurse can accomplish the purpose which her health officer has determined upon.

CONCLUSIONS

The nurse comes to the health department with a record of training as a visiting nurse or as a graduate of a school of training with ideals of service that are distinctive, and frequently finds it difficult to become adjusted to the new relation.

The public is often committed to a program calling for social and bedside relief, and the evolution of sentiment for a purely

public health service is not brought about without considerable difficulty and danger of misunderstanding.

The nurse's knowledge of social and living conditions, as a result of contact under the old regime, is an asset of very vital importance if properly utilized.

The nurse must understand the legal background of the health department and appreciate the responsibility resting upon her director.

The health officer must evaluate the nursing service in its relation to the health program and adopt certain standards for its regulation and development.

The public health nurses on the staff of a unit limited to three or less should be under the health officer's personal direction, but for more than this a supervising nurse may be necessary.

The health officer should be familiar with the conduct of his nurses in their relation to the medical profession and be responsible for the adjustment of any misunderstandings.

The nurse should carry no title other than that of health department nurse, except that she may be known by a special title such as health department school nurse, or health department clinic nurse, etc., etc.

A working program should be posted conspicuously as a guide to the personnel of the health staff to insure orderly deportment and recognition of the directing head.

All information affecting the policies of the health department and all reports should be given out through the director when called for by contributing agencies.

The health officer should hold periodic conferences with the staff for discussion of the progress of the work, and he should at all times encourage the nurses to offer helpful suggestions.

Certain standing orders governing the conduct of the nurse in her relation to the medical profession and other agencies should be worked out and adopted by the board of health.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

FOOD ALLERGY AS A CAUSE OF IRRITABLE BLADDER*

By W. W. Duke, M.D.,
Kansas City, Mo.

In a relatively large proportion of patients with frequent painful urination, the severity of the disorder seems out of all proportion to lesions found after careful examination by specialists and despite the symptoms resembling cystitis the urine may be free of both bacteria and pus. Treatment of the condition may give little relief and severe bladder symptoms may continue almost without remission for months or years. This type of case is rather frequently encountered in the practice of medicine, especially in women, and the most diligent effort to discover its cause may fail completely.

Bladder disorder of this sort is often the result, I believe, of hypersensitiveness to certain foods. I wish to report here a summary of a study of five such cases, one of which is described as an example. A more complete report can be found in the *Annals of Clinical Medicine,* No. 2.

CASE REPORT

A woman, aged 22, was referred to me because of "bladder trouble."

The family history was negative for allergy so far as she knew. The past history was important only for the fact that she had been subject to urticaria at odd times.

For two years before coming to me she had been troubled with frequent burning urination, which was at times so severe as to confine her to bed. She had been treated under many different plans without relief. In fact, she had not been entirely free from bladder pain for a single day during her illness of two years. She was treated by us for ten days with bladder sedatives without relief.

Physical examination showed poor nutrition, slight chronic pelvic inflammatory disease, cervical tear, tenderness over the bladder by abdominal and vaginal examination, tenderness in both kidney regions and marked evidence of ptosis.

A catheterized specimen of urine showed nothing of interest except an occasional pus cell and low specific gravity. Other laboratory examinations, including the Wassermann reaction, were negative.

X-ray examinations disclosed no stone and nothing of further interest except ptosis.

Cystoscopic examination of the bladder and urethra by Dr. J. E. Burns showed nothing abnormal.

Intracutaneous tests with a number of food proteins showed marked sensitiveness to wheat and slight sensitiveness to several other grains (barley, rice and oats). The tests were followed after several hours by an unusually severe attack of frequent painful urination, which lasted twenty-four hours. She was given adrenalin during this attack, with temporary relief.

For treatment, she was told to avoid all grains, especially wheat and its derivatives. All other medication was discontinued. Two days after this she was completely free from bladder disturbance for the first time in two years. She has continued well now several months. She has been completely free of bladder disturbance except for two attacks of one day each which followed the eating of a small amount of wheat flour taken as a clinical test and after the subcutaneous injection of 0.01 mg. of wheat protein. In each of these instances she had an attack of pain resembling that of cystitis, which lasted a number of hours.

A certain rather large proportion of individuals inherit a constitution which makes it impossible for them to become sensitive to some foreign substance. When they become sensitive they react in characteristic ways whenever they come in contact with the substance to which they are sensitive. Patients sensitive to certain pollens, for example, have hay fever or asthma whenever they inhale air which contains pollen to which they are sensitive. In patients of this type, the subcutaneous injection of infinitesimal quantities of pollen extract may bring on the symptoms of hay fever or asthma within a few minutes. Similarly, in patients whose gastric mucosa is sensitive to some food, such as honey or egg, an attack of abdominal pain can be brought on invariably either by the ingestion of a small amount of honey or egg or by their subcutaneous injection.

*Read in Section on Urology, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

The bladder mucosa does not ordinarily come in contact with foreign substances. Bladder symptoms should occur theoretically, therefore, only as part of a general reaction after the offending substance is absorbed in some distant locality. A bladder attack, therefore, would seem analogous in pathogenesis to asthma caused by the ingestion of egg rather than to asthma caused by direct contact between the bronchial mucous membrane and a pollen to which it is sensitive.

I have carefully studied five patients who seemed to me to be clear examples of bladder allergy. Each of the five was subject to attacks of frequent painful urination, often so severe as to confine the patient to bed. In three of the patients nothing was found by history, physical examination, roentgen examination, or laboratory tests which could account for their symptoms except hypersensitiveness to certain foods. In two of the five cases, pathology was found but did not seem adequate to account for the severity of the symptoms. Four of the five cases gave a family history of allergy. Each, at some time in his life, had other symptoms of allergy such as angioneurotic edema, hives or asthma. Each gave positive cutaneous or intracutaneous tests upon injection of small amounts of substances extracted from one or more foods which they were in the habit of eating and in each a characteristic exaggeration of the bladder symptoms followed the cutaneous tests or the subcutaneous injection of small amounts of extracts to which they gave positive cutaneous tests. Four of the five patients were completely relieved of bladder trouble by avoidance of the foods to which they were sensitive, and four had a return of the symptoms during a remission after the eating, as a test, of foods to which they were sensitive.

Each of the patients referred to above was tested for sensitiveness to all common meats, vegetables, to milk, eggs, fruits, sea foods, nuts, condiments, grains, bacteria, to many varieties of animal hair and feathers and to all the common spring and fall pollens of this district. Three of the five cases were sensitive particularly to vegetables and two particularly to grains. In only two were marked reactions given by pollen, and, since we have not observed bladder symptoms in a single case of pollen hay fever or asthma, we believe that in the case of sensitiveness to air carried allergens a sufficient quantity to give rise to a generalized reaction is rarely absorbed. Two of the patients gave positive reactions to bacterial extracts. In neither instance, however, was the reaction so marked as that produced by the injection of extracts of the offending foods.

The above findings seemed to indicate clearly that an irritable bladder can be caused by hypersensitiveness to certain foods. The supposition that bladder pain can be caused by food is not entirely new, especially in the lay mind. The impression, however, has been gained that such pain is due to some acid or crystalline substance in the food despite the fact that other acids such as vinegar and other foods rich in crystalloids produce no such result.

DIAGNOSIS

The diagnosis of bladder allergy is not difficult if one suspects the condition. One may suspect it whenever bladder symptoms seem out of all proportion to clinical findings, especially among patients who give a family history of hay fever, asthma, or hives, or who have themselves had such symptoms. The positive diagnosis of a case is largely a matter of discovering the offending food and obtaining relief by avoidance of it. Intracutaneous tests are especially useful for this and without their use a correct diagnosis may be almost impossible. Unfortunately, bladder reactions are usually delayed reactions and usually do not occur for several hours after the ingestion of food. On this account it is an almost hopeless matter to trace out the source of the disorder by having the patient eat or avoid certain foods. Fortunately, however, cutaneous testing is simpler in this type of case than in other types of allergy because of the fact that in the bladder cases the sensitiveness is almost always against a food. For this reason testing with the enormous number of substances which gain entry through the respiratory tract is not so necessary as in nasal and bronchial cases.

We recommend the intracutaneous method in testing rather than the cutaneous method. Cutaneous tests, while useful in testing for sensitiveness to air carried allergens, may fail in bladder cases.

TREATMENT

The treatment of bladder allergy may be carried out along four lines: first, removal of the cause; second, specific protein treatment; third, symptomatic treatment; and fourth, removal of contributary causes should they exist, such as polyps, caruncle, or superimposed cystitis.

Removal of the cause is simple when a person is sensitive to an unusual article of diet such as asparagus, onion, tomato, or artichoke. Removal of the cause is difficult when one is sensitive to an ordinary article of food such as milk, egg, or wheat which is used so commonly in cooking. It is only in the latter type of case that the second method of treatment, namely, specific protein treatment, is justified.

Fortunately, in this type of illness time may be a remedy and patients who at one time may be highly sensitive and invariably react to a certain food may, after a period of months, fail to react to such amounts as they encounter in their ordinary diet.

As a symptomatic remedy, adrenalin, given in sufficient dosage, is recommended. Patients vary markedly in their susceptibility to adrenalin so that a hard and fast dose cannot be surmised. For this reason it is advisable to start with 0.5 c. c. or less of a 1-1000 solution given subcutaneously very slowly. This can be followed at intervals of from five to ten minutes with 0.25 c. c. doses until the patient experiences relief or until the symptoms of reaction to adrenalin become more disagreeable than the bladder symptoms. Adrenalin may be repeated every four to twenty-four hours thereafter, depending upon the time at which symptoms begin to return. Other bladder sedatives can be used in conjunction with this.

CONCLUSIONS

In patients who have frequent painful urination or constant pain over the bladder, the severity of symptoms is often out of all proportion to lesions found after careful examination by specialists in different lines. In patients of this type the bladder disorder is frequently the result, I believe, of hypersensitiveness to certain foods which they are in the habit of eating.

It is well known that a certain percentage of humans may become sensitive to foreign substances of many varieties and that when this is the case they react in characteristic ways whenever they come in intimate contact with the substance to which they are sensitive. Since the bladder mucous membrane does not under ordinary conditions come in direct contact with alien material, the local symptoms in bladder cases occur only as part of a general reaction after the alien material has entered the body through some distant port in quantity sufficient to give rise to a general reaction.

The subjective symptoms resemble those of cystitis and may be either mild or so severe as to confine a patient to bed.

In uncomplicated cases, complete relief may immediately follow the avoidance of the food to which the individual is sensitive and symptoms may recur when the ingestion of such food is resumed.

DISCUSSION

Dr. John T. Geraghty, Baltimore, Md.—Very few of us feel competent to discuss Dr. Duke's paper because it is in a field with which most of us are unfamiliar. I have two or three cases that I shall now have investigated from this standpoint. They have resisted all forms of therapy and are free of any pathology that we can find. They have frequent, painful urination.

Dr. Edgar G. Ballenger, Atlanta, Ga.—I would suggest that Dr. Geraghty and Dr. Duke get together to see if some of these kidney pains are due to something in the food ingested.

Dr. Arthur L. Chute, Boston, Mass.—Just a word about one of the obscure conditions that we have at times found acting as the cause of considerable frequency in women. I have seen this particularly in the straight-waisted type of women who have persistent bladder irritation with no

definite bladder pathology to account for their discomfort. Dr. Joel E. Goldthwait first called my attention to the fact that these symptoms may be the result of general ptosis of the abdominal organs; the pressure of prolapsed intestinal coils producing bladder irritation in the same way that we see this in pelvic tumors that press on the bladder. Postural treatment of this condition carried out by orthopedists has in some cases given good results, favoring the view that the bladder symptoms were due to the weight of the viscera resting on the bladder.

Dr. James T. Wolfe, Washington, D. C.—I yesterday read a paper on the vagus reflex as a cause of bronchial asthma before the Medical Section, and in the discussion of that paper a point was brought out which bears on this question. Dr. Levin cited the fact that certain proteins were not split up properly, but were absorbed in the circulation in a raw state, and that these proteins then precipitated an attack in the bronchial tubes known as asthma. Whether that comes about as a direct stimulation of the bronchial muscles or of the vagus nerve is a question. To my mind, it is more a stimulation of the nerve, because of complications in my work.

In regard to the bladder, it is easy to see that any abdominal condition that prevents the splitting up of the proteins of articles of food in the act of digestion might permit them to get to the nerves of the bladder and irritate them. Dr. Duke has told me that as a result of this work they are finding a large percentage of pathologic lesions in the abdomen.

I have had two cases, one sensitized to milk chocolate. This patient was not only bronchitic, but asthmatic, and had the condition described in my paper, which time will not permit me to describe here. After correction of this condition the man could eat chocolate at will without bringing on an attack of abdominal pain or bronchial asthma. The same principle seemed to apply there, that the protein which was in the chocolate was not digested, and after the digestive process was restored and he split this up properly it no longer entered the system in such a way as to irritate the nerves or muscles.

Dr. Duke (closing).—Just one or two words to correct an impression I may have made that this is a rare condition. It is relatively common. I have observed at least ten of these cases in a few years. In a urologic practice I am sure it would be a more common finding.

In regard to Dr. Ballenger's question about kidney pain, one of my patients had kidney pain, and in one we found urinary changes. I did not wish to go into either of these cases in detail because my observations were not broad enough to prove the point. I believe that if a urologist would take this up he would probably be able to prove it to his satisfaction in certain cases of otherwise unaccountable kidney pain.

AMPUTATION ABOVE THE ELBOW*

By B. A. Washburn, M.D.,
Paducah, Ky.

In presenting my subject I shall endeavor to show cases that come under the head of unique conditions, considering the character of the wounds and their prognosis.

There are three points of consideration in handling the cases to be presented:

(1) The extent of trauma and its repair.

(2) The function, involving nerves, tendons and joints.

(3) The question of deformity.

The extent of trauma, where tissue and bone is destroyed, immediately presents a question of the life of the injured parts, as well as the life of the patient. If there is a rapid recovery from shock conditions, and I am of the opinion that this is largely governed by the physical resistance of the patient, it is best to make the effort to save the forearm. Whatever is left will far exceed the benefits of an artificial arm or hand.

Our next consideration is the tissue destruction and how we can best repair the condition to give function in keeping with age and vocation. The appearance of extensive tissue damage often makes us render a hurried decision regarding a prognosis, and frequently an amputation follows. In many cases a useful forearm could be given the patient if we had more confidence in tissue repair and drainage. When we see the nerve damage, torn tendons and crushed bone, our first thought is that such laceration demands immediate amputation to save the patient. It does not matter how severe the damage, it will be gratifying to note the results when the tissues are coapted. Your patient will appreciate any part of a normal function as compared with an artificial appliance.

Remembering that the shoulder gives us greater compensation in regard to function than any other joint about the body,

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

we should fortify ourselves against amputation.

If it is necessary to fix the elbow joint at right angles, or if you must sacrifice one of the forearm bones, do so. If you find all the bones of the hand crushed it is not always necessary to amputate. Coapt the fragments and drain and you will get results.

There is a tendency to fear nerve repair, but time will correct most cases under treatment. Very interesting conditions

Exhibit A, Fig. 1.

are developed with wrist drop, and often when we have good results as to wound repair, the patient will present a wrist drop or a disuse of the forearm. This is due to a nerve complication or blocking caused by fibrous thickening of tissue. You then doubt the advisability of not amputating.

In the different cases shown upon the screen there is one method I have selected for the purpose of securing the best function of the arm in its entirety. A preference is shown for a fibrous ankylosis instead of a bony ankylosis, remembering that the ulna is the handle for the arm and the radius the handle for the hand. In fixing the arm a right angle degree is best with a fibrous ankylosis, because there will be a percentage of supination and pronation, the radius taking care of the function at the wrist joint (shown in Exhibit A) and vice versa. If the upper third of the radius is destroyed and the olecranon process will function you can have extension and flexion, with the end

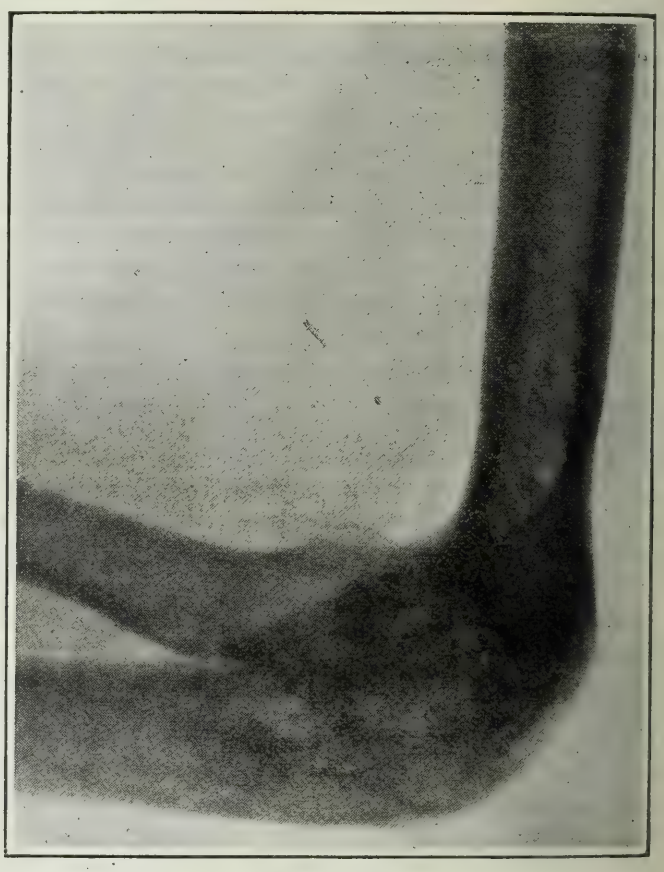

Exhibit A, Fig. 2.

of the radius keeping a fair formation at the wrist joint (as seen in Exhibit B).

We have many cases of traumatic surgery where the patient cannot remain in a hospital for months to permit of the bone grafts, and these same patients cannot permit an amputation because such a disability makes them unable to obtain employment.

In Exhibit A there is a case of renewed trauma which verifies the statement that many amputations are unnecessary. This case refractured the bone by a second accident, the screws splintered the bone and divided the shaft into four parts, produc-

ing severe trauma to the nerves and causing wrist drop. This case presented typical conditions for amputation, which was not performed. The case made a good recovery and now has normal function of the entire arm.

All of these cases shown upon the screen are of the type for amputation, but they were treated with plenty of drainage,

Exhibit B, Fig. 1.

dressings, splints and exercise. The pictures show for themselves the results obtained.

These cases should be of much interest to the insurance companies. It is much better to have a small percentage of disability with a reasonable bill for professional services and a satisfied patient than to have a small bill with neglect and a permanently disabled patient.

EXHIBIT A, FIGS. 1 AND 2.

I call your attention to this case and the type of injury. This arm was caught in a roller at a mill and passed through the machine up to the upper third of the forearm. The first examination of the arm made amputation seem necessary. But the patient was willing to undergo any number of operations to save the arm. By coapting the bone fragments and uniting the tendons I obtained gratifying results. The depressions in the palm show the drains that were necessary. Each finger had one or two drains and

Exhibit B, Fig. 2.

the medium surface of the forearm was drained under the wrist band. Close observation will give an idea of the large number of scars caused by the torn tissues and the drains. This arm was kept in 25 per cent alcohol for two weeks, followed by two weeks in a solution of bichlorid, and then hot packs. The insurance company was out only the doctor's bill and the time lost. There was no disability claim. The patient now has perfect function. Please notice what would be the difference in the expense of the loss of a forearm and the bill for services.

When I use the words laceration, contusion and crushed, I mean them in the fullest extent of their definition.

EXHIBIT B, FIGS. 1 AND 2.

This is the type of gunshot wound that sometimes requires and often receives amputation. I call your attention to the previous remarks regarding the olecranon process. It is the handle to the arm and will function by giving extension

and flexion independent of any support of the radius. In the next picture we have the hand showing the relationship of the radius and the usual anatomical formation maintained by the radius. This arm was not amputated and has maintained anatomical relationship, as shown by the picture, for eight years. The man is now doing manual labor and succeeding at his work. This type of cases should receive careful consideration before amputation is performed.

EXHIBIT C, FIGS. 1, 2 AND 3.

EXHIBIT C

I show this picture first and last in this case because it gives you the field of operation and also the final results. This is a case of traumatic origin, osteomyelitis follows, involving the entire

Exhibit C, Fig. 1.

shaft of the humerus. A diagnosis was made of tuberculosis. The exostosis at the surgical neck of the humerus was so great that it had increased the normal thickness of the bone about an inch. Compare this to the complete destruction of the middle of the humerus. There was a difference of an inch and a half in the normal length of the bone. Loose ends of necrosed bone and a large spicule were making pressure on the musculospiral nerve. This picture was taken two years after the operation. Notice the difference in the facial expression of the girl then and at the time of her discharge from the hospital. This picture shows her at that time, showing a complication which had arisen, disuse of the hand and wrist drop. These traumatic wrist drop cases present a very discouraging appearance to the patient, but time and treatment will take care of most of them. In this picture you get an idea of the degree of the wrist drop. Notice the use of the boot in correcting this defect. I exhibited this some time ago at

Exhibit C, Fig. 2.

Louisville before a meeting of the Railway Surgeons, and it is now used in many surgical clinics. I turn again to the first picture to show the per-

Exhibit C, Fig. 3.

fect control that the patient has of the wrist, and her physical development.

DISCUSSION

Dr. W. Barnett Owen, Louisville, Ky.—I have never had the unfortunate result of erosion of bone from the application of plaster of Paris.

Of course, it is our duty to save all fingers, hands and arms, and make them as useful as possible, although the function may not be made normal. We can frequently be successful in saving portions of functionating arms and limbs. It is to be done in every possible instance, and also, of course, in fractures into or near joints, where we get an ankylosis, it is always advisable to have the ankylosis in such a position that the arm will produce the greatest amount of function.

Dr. R. W. Billington, Nashville, Tenn.—I think we should emphasize the point which has just been mentioned in the discussion, of getting the ankylosis in the best functioning position, particularly in the fingers. That is not taken into consideration as often by orthopedic surgeons as in the case of the larger joints. I think we have all been impressed with the fact that there is one type of splint used on injured fingers, and that is a wooden tongue depressor. It seems that it is a handy thing, and so it is used by surgeons in splinting an injured finger. As we all know, a stiff finger in an extended position is very much in the way. It is a very simple thing to take a pair of heavy shears and cut out in a minute from heavy tin or sheet iron a splint that will permit flexing. Even if there is never any restoration of motion you have a good functioning member, and one that can be opposed to the thumb in grasping objects, and if there is hope of mobilization of the joints we have the finger in mid position, so that the movement can be obtained in both directions. As you know, if we start from the mid position and work both ways, we get the movement more than twice as rapidly as if we have the finger in the full extended position and have to work one way. I think one or two of the cases illustrated by the Doctor show that point, but the principle is often neglected.

Dr. E. Laurence Scott, Birmingham, Ala.—I wanted to say something about the use of the Esmarch bandage and tourniquet in operating upon arm injuries. In Birmingham we have all been liberal in the use of it. About seven or eight weeks ago I was called to do some little repair work on an elbow of a husky individual. Feeling we could use it, I had the Esmarch and tourniquet put on. I happened not to see the assistant put it on, and asked him if he thought it was not too tight. It was somewhat loosened. About two days after the operation the man could not use his fingers at all. It has taken that man seven weeks to start any movement, and I believe the fault was the assistant's tying the tourniquet too tightly. That is the first bad experience I have had in using the Esmarch bandage and tourniquet on the arm. It is a thing that might occur again.

Dr. Washburn (closing).—My object in showing these pictures and giving the history of each case was for the purpose of establishing the fact that there are many unnecessary amputations performed. The work of the orthopedic surgeon is to save and to establish function of injured parts, which calls for a careful study of each case before and after operation. It is true that in amputations the case is soon terminated, but the personal satisfaction and the appreciation manifested by the patient when you have succeeded in saving and giving function to the injured parts is much greater and will bring forth a greater reward.

I call your attention to this fact: Regardless of the trauma and contusion to parts, if you can maintain the proper drainage you will give to the patient a percentage of function that far exceeds artificial appliance both as to service and appearance. Cases I have shown on the screen are of the type that show extensive destruction of parts, and which presented an appearance that seemed to indicate an immediate amputation. However, parts were saved and function preserved in each case.

Repair, plenty of drainage and frequent dressings are the basis for successful work.

RECTAL EXAMINATIONS IN OBSTETRICS*

By Burnley Lankford, M.D.,
Norfolk, Va.

The subject of rectal examinations in obstetrics is becoming somewhat hackneyed; nevertheless, from occasional conversations on this subject, I am convinced that this valuable procedure is being used less than it should be, and this paper is an effort to show some of the advantages of becoming familiar with rectal as well as vaginal touch. Ever since the days of Semmelweis and Holmes, men who are really interested in careful obstetrics have feared vaginal examinations and have steered away from them as much as possible.

Efforts are constantly being made to develop some technic or apparatus that will make vaginal examinations safe, but so far none of them are quite satisfactory, and the best routine substitute is the rectal.

There are two main reasons why the rectal rather than the vaginal examination should be used as the routine, reserving the vaginal for the unusual case. First, it is safer for the patient; second, it is more convenient and time-saving for the attendant. If these two reasons are true

*Read in Section on Obstetrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

ones, and if the rectal examination will give us sufficient information about the average case, should it not be universally used?

With regard to its being safer, no one will dispute the assertion that the vulval region is always contaminated with colon bacilli, the chief ones we have to fear from the patient's own skin. Likewise it is probably true that the vulval region is, surgically speaking, the most unclean region of the body. Our own fingers and finger nails are constantly being infected with various pus organisms, as well as other pathogenic bacteria, such as are found on our handkerchiefs, or are being constantly transferred to our hands by our own acute colds, or chronic pyorrheas and sinus infections. When we are not infecting ourselves we are receiving infections from our friends, shaking their hands and receiving their pyorrheas, sinus infectious materials and occasional colon bacilli. Dentists tell us that every person who reaches the age of thirty has pyorrhea, and many younger. Some one has said that the extent of "swapping of saliva" cannot be imagined unless there were some way of coloring all saliva a brilliant blue or green and then watching its ramifications. The fifth nerve would not be in the same class. (In this connection the unreliability of the various kinds of toilet paper may be mentioned as proof of the frequent contamination of our hands.) Hands and the vulva region are always potentially infective.

We cannot escape the probability of carrying infection up to the cervix by the use of gloves. It is an exceedingly difficult matter to get a culture from the cervix or uterus without carrying up some contamination from below. Special apparatus has to be used by those who do investigative work on bacterial flora of the vagina and cervix, and we certainly cannot hope to make routine vaginal examinations without the strong probability of carrying up some infectious material. Therefore it seems reasonable to conclude that the first advantage mentioned above, namely, more safety for the patient, has been upheld. In actual practice, Alfred C. Beck has shown by a series of cases that the morbidity where rectal examinations were used was much less than where vaginal examinations were used. Where gloves are not worn—and the use of gloves is not by any means universal—the risk to the patient is greatly increased, because the bacteria carried in are foreign to her and may be pathogenic to her. She may have developed an immunity to such pathogens as inhabit her own domains, which may be carried in by the gloved finger. The vaginae of all multiparae and most primiparae contain organisms that are considered pathogenic, and it is probable that one of the reasons why all women are not infected at the time of labor is on account of their acquired immunity to indwelling bacteria.

Now as to the second advantage claimed, namely, convenience and time saved to the physician, where vaginal examinations are used, the care that every conscientious man should take in the effort to make as clean an examination as possible, is very time consuming, and in addition leaves much to the efficiency and conscience of the nurse who prepares the patient. It must be remembered, too, that every vaginal examination calls for the same care, and where there are numerous examinations made on the same woman the chances are largely with the germ and against the woman.

The preparation for rectal examination requires from the doctor no more than ordinary cleanliness such as every man uses before palpating an abdomen (washing the hands with soap and water) and the use of a finger cot. The cot-glove type is preferable to the ordinary finger cot, because the ordinary cot allows the base of the finger to come in contact with the anal region, whereas the cot-glove protects that part of the finger. Another reason why finger cots should be used rather than gloves for rectal examination is that they (the cots) can never be mistakenly used for vaginal examinations after having been once used for rectal work, as may happen when gloves are used for both. The cot should be boiled after use, not necessarily before use. The patient requires no further preparation from the nurse than an enema and subsequent external sponging and draping.

She may be examined in the lateral posture, but my own preference is for the dorsal, as it seems to me easier to visualize the conditions when the woman is on her back. Immediately after withdrawing the finger the woman should be directed to turn on her side and the anal region should be wiped several times with lysol or some other antiseptic solution, always wiping in a backward direction away from the vulva.

If safety and convenience, then, are the advantages, what are the disadvantages of the rectal examination? It may at times be a little more painful than the vaginal, but, except in cases with marked or tender hemorrhoids, a rectal examination conducted in the correct manner seldom causes more than a feeling of discomfort. The patient should be told that an examination is to be made by the rectum for the reason that it is safer for her, that you do not think it will be painful, and that the worst is usually only a feeling of discomfort, as though the bowels had to move. Some good lubricant should be used, and, as painlessness to the patient depends largely upon proper lubrication, the lubricating agent should be used freely, placing a little upon the skin at the anal orifice as well as on the end of the examining finger. The various forms of Iceland moss lubricants are the best as well as most convenient. One should not use vaselin, as it is a poor lubricant, cannot be sponged off easily, and ruins rubber. The finger should be slowly and gently introduced and after passing the sphincters should be held perfectly still for a few seconds, while the patient becomes accustomed to the unusual sensation, which she should be reminded just at this time is not a feeling of pain, but only one of discomfort. If we now keep in mind that the finger in the rectum is feeling the cervix, os, membranes, fetal parts, just as it would if in the vagina with the exception of having the rectal septum interposed, rectal examinations will become increasingly less difficult and less confusing. The rectal wall is not very thick and as soon as we learn to negative that partition with the finger, just as we negative the sight of one eye when looking through a microscope or ophthalmoscope, we shall have reached the point where rectal examinations will mean something to us. It must never be forgotten that this dividing wall is more tender than the vagina and that it should not be pushed against too hard or suddenly if we do not wish to draw resistance or remonstrance from the patient. The finger nail should be quite short.

What can we learn by this method? Bearing in mind the apparent stage of labor in which the woman is when the examination is made, the finger gently searches for what would feel like the cervix if the finger were in the vagina. This, of course, will vary much with the stage of labor. In the early first stage it is often felt as a soft, knob-like, protuberance against the presenting part, over and around which knob the finger can be gently swept until the central opening is found. The location of this protuberance is not always the same. At times it will be so far back that it can barely be reached by the examining finger and cannot be accurately enough palpated to give much information. Do not, for that reason, resort at once to a vaginal examination, but rest assured that the woman is not in labor or that you have felt the cervix in the early stages of labor, or before the cervix has been thinned out, or the os opened to any extent. You know the woman is not in danger of precipitate or early delivery, and that in a few hours a second rectal will probably give you the information you seek. At another time the cervix will be well to the front and easily recognized, the os will have opened up enough for the rectal finger to determine whether or not the membranes have ruptured, how much the membranes are pouching down ahead of the presenting part, whether we have a cephalic or breech presentation, how firmly the presenting part is fixed in the pelvis, how high up from the anus the presenting part is (measured by number of phalanges, 1, 2 or 3). It may be possible at this time to tell in which direction the sagittal suture runs and in what position the fontanels are, and if we can gain as much information as that, there will seldom be need for any further internal examina-

tions, rectal or vaginal. The progress of descent can usually be made out by external means. Certainly after the cervix has been obliterated and the os dilated to six or more cm. (4 or 5 "fingers") we may distinguish the sutures and fontanel, anterior or posterior. In abnormal cases we can suspect placenta previa and a prolapsed cord. If the cord be pulsating we can certainly diagnose it. During the latter weeks of pregnancy the rectal examination should always be used, as we never know just when labor will begin, and ante-partum vaginal examinations are never undertaken with as much care as after labor has started. The rectal touch may be used for rupturing the membranes in an absolutely clean manner. With the left forefinger in the rectum, recognizing the edge of the cervix and the pouching membranes, the vulva is sponged off. The nurse separates the labia widely and holds them thus while you pass with the right hand by sight and without touching any external parts, a curved Kelly clamp. This you guide by means of rectal finger against the membranes, which are easily ruptured during a pain.

Where for any reason the rectal examination is entirely unsatisfactory (inflamed hemorrhoids, fissure in ano or a full rectum) or where, having made one, we cannot get any definite information, as sometimes happens, if there be any need for haste, there is no reason why a vaginal should not be made. The point I hope to make is this: When, by a little practice, we can derive what information we need by rectal examinations, when we know they are safer for the patient and more time conserving and convenient for us, why not adopt this as the routine, reserving the vaginal route for unusual or abnormal cases? If this be carefully done in every case, it is safe to say that soon the apparent need for vaginal examinations will become less and less and a valuable procedure will have been added to the obstetric armamentarium of the man who uses it.

Discussion follows paper of Dr. Newman, page 790.

ECLAMPSIA: ETIOLOGY AND TREATMENT*

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Looking over the records at the West Main Maternity Sanitarium, I was surprised to find nine cases of eclampsia in one hundred and sixty consecutive confinements. The estimation of its frequency has been variously tabulated, from one case in each five hundred to several times in every one hundred pregnancies. Each author gives a different percentage, and it differs in different hospitals. It is said to be more frequent in primigravidae than in women who have born several children. It is stated that the complication appears in one per cent of all cases of albuminuria of pregnancy. In my own series of cases the following data were noted: it occurred once in about eighteen normal pregnancies; six cases were in primiparas, under twenty years old, and three in multiparas, over twenty-five years of age; five cases were antepartum eclampsia, two during labor, one before and after labor, and one postpartum; five cases were "unfortunate" girls, and four were married women; seven cases came from rural districts and two were from the city; eight have had, more or less, albumin in the urine, and sugar was found in two; one patient had taken large doses of quinin which brought on convulsions; one patient had a slight heart lesion; two were subject to gall stone colics; and one showed signs of maternity insanity. The blood pressures varied from 140 to 195 systolic and from 60 to 120 diastolic.

Despite the fact that very much has been written on the etiology of eclampsia, it is generally conceded that science has not, as yet, succeeded in solving the entire mystery of the origin of this disease. The number of theories about eclampsia are so great that the disease was called for a long while "the disease of theories." Zwei-

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fel has summarized fifteen theories as the cause of toxemia, late as well as early, in pregnancy. Some of these theories are purely speculative. The time limit of this paper will not permit to discuss fully even the more plausible theories. However, a knowledge of the etiology is so important to the proper management of the disease that one is tempted to give at least an outline of the several more essential theories.

It is generally conceded that certain unknown toxic substances are elaborated somewhere in the metabolism of a pregnant woman. The presence of these substances in the body are considered to be the cause of vomiting and the pathologic changes which result if the diseased condition is prolonged. Underhill and Rand point out that there are four main theories as the source of these toxic substances.

The first is that the toxins are of gastrointestinal origin and akin to an ordinary autointoxication. The second theory is that the toxins occur as the result of disturbances in the various glands of internal secretion. The third point is that the toxins are of fetal origin. The fourth theory is that the source of the toxic substances results from the disturbances in the liver and kidney metabolism and function.

Taking up the four theories, Titus states that it was Dirmoser who first stated that these toxins were the result of intestinal putrefaction, and Le Larnier elaborated this idea by the opinion that the condition is due to a placental toxemia plus a deficient bowel action. McDonald thinks that the trouble originates in digestive faults of duodenal origin. Albert is of the opinion that bacterial action as found in an infectious endometritis may produce absorbable toxins, while Talbot observes that a definite focus of infection in such places as the teeth, the tonsils, the sinuses, or the ears is practically always to be found as an underlying cause of toxemia.

Tweedy suggests that the ordinary food may become poisonous during pregnancy, and when in this condition it gives rise to toxemia and eclampsia. He claims that the antibodies present in our blood are called, during pregnancy, to fulfill a double role; in addition to their normal work, they are compelled to deal with the albumin which is constantly exuding into the maternal blood from the ovum. The effect of this toxin is noted through all the degrees of toxemia from morning sickness to eclampsia.

Lange and Nicholson, attacking the problem on the side of the glands of internal secretion, are confident that the trouble is due to some failure of the thyroid to function right. Masseglia explains the pathogenesis of eclampsia as due to parathyroid hypofunction, that the substances not converted by the parathyroid secretion go to the kidneys. But these catabolic substances easily injure the renal tissue. The time comes when they cannot be eliminated from the body, eclampsia being the final result. Other writers feel that adrenal insufficiency is the true factor in hyperemesis gravidarum, while some authors believe that toxemia of pregnancy results from a deficient corpus luteum secretion.

That the toxemia is of fetal origin is plausible and has many adherents. The reason that such toxemia is peculiar to pregnancy, and resulting from the presence of the fetus, must, therefore, be due to certain unknown fetal products. These may be serologic or metabolic, according to various observers. There is still a difference of opinion as to whether the placenta or the fetus is the point of origin of the toxin. Some authors believe the fetal protein acts like a foreign protein, while others assume that the maternal circulation is flooded with products of fetal catabolism or toxic ferments.

A study of forty cases of toxemia at the Maternity Hospital, Edinburg, led Young and Miller to the conclusion that eclampsia and the pre-eclamptic state are due to the circulation in the mother's blood of a specific substance or substances which produce: (1) degenerative changes in the kidney and albuminuria; (2) characteristic necrotic changes in the liver; and (3) convulsions.

A great many experiments have been done to determine organic specificity of the placenta and its relation to eclampsia,

proving the presence of placental substance in the circulation by means of precipitating serum. Those experiments have brought out that the molecules of nitrogen are broken up and the NH_2 group is freed. The splitting is greater in the placenta than in other organs. The placenta is the spot where the eclampsia toxins are formed as a hydrolytic ferment. The chemical change causes the picture of the disease.

Fahr describes changes in the kidneys of twenty-eight eclamptic patients. The most important and the most common pathologic change affected the walls of the capillaries of the glomeruli and was characterized by a spreading and thickening of the capillary wall of varying intensity. Another rather frequent finding in the kidney was the presence of hemoglobin casts. The eclampsia toxin acts on the blood and blood vessels. In the kidney this action is most noticeable in the glomeruli.

Hepatic lesions are so constant in toxemia of pregnancy that liver involvement is indisputable. The liver is the carbohydrate storage organ of the body, maintaining a reserve supply of glycogen which can be drawn upon as needed in the general metabolism. It is also the great detoxicating organ of the body, being called upon to combat the effect of any poison either ingested or elaborated within the body. When the liver is not well stored with glycogen it is far less able to perform its various functions, and its ability as a detoxicating organ is impaired. The consumption of glycogen during pregnancy is markedly increased. It is to be expected that the liver would become more or less depleted of its glycogen stores, so it becomes less able to cope with any toxins in the system.

This "glycogen depletion theory," according to Titus, establishes fairly well the reason for individual resistance to the toxins which may be assumed to be present in every pregnancy.

Mann and Magatt have found a progressive fall in blood sugar after total extirpation of the liver of the animal, and coincidentally a decrease in glycogen content of the muscle. The first symptom occurs coordinately with this decrease in blood sugar, but during any stage after symptoms develop up to the point at which respiration actually stopped, if glucose is injected, the animal immediately recovers. This process can be repeated many times before the animal finally dies with its blood sugar not below normal.

In my limited studies of eclampsia, I have observed that practically in every case the liver or kidneys, and more often both, showed signs of intoxication. The toxins may have been taken by the mouth, as drugs or certain foods, or they may have been formed in the system through the fetus and placenta, and through the circulation affect the same organs. In other words, the gastro-intestinal tract may be the source of the intoxication or the fetus may be the point of origin. I wish to report briefly a case of a young woman whose kidneys and liver were normal up to the time of labor. But by taking large doses of quinin the kidneys, and probably other organs, too, were affected, which brought on, several hours later, a sudden paroxysm of convulsions that continued even after labor. If it is possible for quinin to produce such a condition, it is reasonable to suppose that other drugs may affect some patients similarly. Again, a heavy protein diet may, in some cases, tax the kidneys, intestinal tract and liver to such an extent that the system is not able to eliminate all the waste products and we get symptoms of intoxication which may result in eclampsia. In cases where we are unable to discover an outside cause we must consider the possibility of a poisonous material being thrown into the circulation by the fetus and placenta, affecting principally the organs of elimination. If these organs are not able to throw off the toxins the patient will suffer the consequences.

Miss D., age 20, entered the West Main Maternity Sanitarium March 2, 1921. Her family history was negative. Physical condition was good. Urinalysis was normal. Blood pressure: systolic, 140; and diastolic, 90. Abdominal examination showed the uterus the size of ninth month pregnancy. Position of the fetus was normal. March 30 she took, on advice of another patient, about sixty grains of quinin in large capsules during the day, presumably to bring on

labor. The last capsule she took about 8 p. m. At 10 p. m. she complained of a severe pain in the pit of her stomach and began vomiting.

I saw her about 10:30 and she was screaming from pain. Therefore, no examination could be made or a history of the trouble ascertained. She was given morphin gr. ss hypodermically and the stomach was washed out. At 2 a. m., March 31, she suddenly began to have convulsions, four in succession. Another one-half grain of morphin was administered and an examination was made to ascertain if she were in labor. As the cervical canal was well dilated preparations were made for delivery. At 3:30 a. m. I delivered, with low forceps, an eight and a half pound boy; and three drops of pituitrin were given to control hemorrhage. In fifteen minutes she had three more convulsions. One-fourth grain morphin was given and the patient fell asleep. At this time the systolic blood pressure was 150 and the diastolic, 60. She had no more convulsions and slept practically the whole day. No urine was passed until 10:30 that night, when she was catheterized and we got ten ounces of urine.

The urinalysis was as follows: sp. gr., 1030; reaction, acid; albumin, present; no sugar; blood present to naked eye; and microscopically, many hyalin and hemoglobin casts and blood cells were present.

Evidently all the pathological findings appeared in one day, as urine examined a day previous to the illness was normal. I did not know that the patient had taken quinin until after labor.

The temperature and pulse that day were: at 11 a. m., temperature, 98.8°, and pulse, 96; at 4 p. m., temperature 100.4° and pulse 104; and at 7, temperature 97.8° and pulse 80.

We had to catheterize her for the next five days, and the quantity of urine varied from twelve to eighteen ounces in twenty-four hours. On the second and third days the urine was practically all blood, but it began to improve on the fourth day, and on the eighth day there was no blood and only a trace of albumin.

The temperature varied from 97.8 to 100.4°, and the pulse from 80 to 104.

She was more or less in a stupor for about eight days.

On her fourth day she had a quinin rash all over the body which annoyed her for over a week.

She and the baby left the hospital in good condition on the twenty-second day.

The treatment of eclampsia resolves itself, first, into the watchfulness of the patient in the pre-eclamptic state—every precaution to prevent the onset of the disease should be taken; and, second, what should be done after the occurrence of one or more convulsions.

There is a general belief that a large number of cases of eclampsia can be prevented by rigid prophylaxis. The urine should be examined twice a month, or oftener, for albumin, casts and solids. The blood pressure should be frequently ascertained.

The diet is important. All meats are cut off and when prodromal symptoms are noticed nothing but milk and plenty of water are given. The bowels should be taken care of and every possible means to produce elimination should be resorted to. The patient should be cautioned to notify the physician whenever she suffers from headache, anorexia, gastro-intestinal derangements, mental and physical lassitude, disturbance of vision, or edema.

Unfortunately many patients do not engage a physician until the last minute. Many a time a physician is called to a case of confinement and finds that the woman is in convulsions. What should he do in such an instance?

An eclamptic seizure presents a desperate condition. Rational curative treatment of this affection will remain uncertain as long as its pathology continues obscure. As Williams says, no matter what treatment may be pursued, many women recover, many die, while others do fairly well practically without treatment. Each case must be treated in accordance with its existing indications. It is important to control the convulsions, to stimulate elimination and to empty the uterus, if it can be done without producing injury to the mother or child or severe shock. The method advocated here is practically the same as used in a number of large maternity hospitals in this country. When a patient is seen in convulsions she is given one-half grain of morphin hypodermically; her stomach is washed out; two ounces of castor oil are poured down the tube at the end of the lavage, and she is given a colonic irrigation of 5 per cent glucose solution. If the blood pressure is over 175 systolic, phlebotomy is done to bring the pressure down to 150. One-quarter of a grain of morphin is administered every hour until the respiration drops to ten per minute.

The question as to the advisability of early operative interference is a grave one. In some cases a speedy delivery is facilitated by the fact that uterine con-

tractions come on or increase in force soon after the onset of the disease, and labor usually pursues a more rapid course than usual. If, however, labor has not set in and the cervical canal is intact, the question of rapid delivery becomes more complicated, and it becomes necessary to determine whether it is more advisable to adopt expectant treatment or to attempt to hasten delivery. The present status is to treat the patient medically as a toxemic. Neither forceful delivery nor cesarean section has a place in the treatment of convulsions. If she falls into labor, she should be permitted to be delivered spontaneously. At most an episiotomy may be done or low forceps applied to shorten the second stage of labor. In the nine cases reported, no operative procedures were used except forceps, and with one mortality of mother and one child, which died just after it was delivered. The fatal case, a primipara, was brought to the hospital in a moribund condition, in her seventh month of pregnancy. She was in a comatose condition, in labor, and had several convulsions when I saw her. The cervix was partly dilated. It was too late for medical treatment in this case. I completed the dilatation and applied forceps. Not regaining consciousness, she died two hours after delivery. The child, though born alive, died soon afterward. Excluding this case, our mortality in eclampsia is nil.

Abdominal cesarean section is indicated under the following conditions: a primipara with a long, hard cervix, having severe convulsions at frequent intervals, unconscious between them, labor absent, in a hospital, with a competent operator, and not previously infected by examining hands. Vaginal cesarean section requires a skilled surgeon with the proper environment.

To recapitulate what has been said about the treatment of eclampsia, the following deductions may be drawn:

(1) The importance of pre-natal care should be stressed.

(2) Intermediate and conservative treatment yields lower mortality and morbidity than is obtained by surgical and forcible intervention.

(3) Immediate delivery by cesarean section is rarely necessary, unless there are present indications of disproportion, rigid cervix, etc.

(4) Each case must be treated in accordance with the existing conditions.

In conclusion, let me emphasize that eclampsia is still a grave disease; it is not so infrequent as many text books tell us; it is important to educate the people to engage a physician early in pregnancy; every expectant mother should be studied carefully; and when the disease does occur the physician should be ready to combat the condition conservatively, and to save the mother with the least risk or shock, and if possible also the child.

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DISCUSSION

Papers of Dr. Lankford and Dr. Newman

Dr. Erasmus H. Kloman, Baltimore, Md.—When I began making rectal examinations I felt hopeless. The finer details that I had become accustomed to learning through vaginal examinations were lost and it took a great deal of practice to recognize them through rectal. But we must remember that it took practice when we began making vaginal examinations.

So far as the difference in knowledge gained from vaginal examinations and rectal examinations, there is very little. The occasion may arise once in a great while for a vaginal examination, but this gets us away from the old method that some of the men have been known to use, i. e., making vaginal examinations every few minutes.

The point brought out by Dr. Lankford about the rare cases where the cervix cannot be felt should be remembered, but these cases are certainly safe until the cervix is pushed far enough down in the birth canal to be felt, providing the patient has no systemic symptoms.

I do practically no general obstetrics in my work. My gynecology has dwindled it down to operative obstetrics. I will not work for men who persist in making vaginal examinations. If a man brings a case to me for cesarean section on which he has been making vaginal examinations, I shift the responsibility to him and will

do almost any other operation rather than a cesarean section. I have made several enemies among the profession by being strict about the use of rectal examinations, but I have done the equivalent in good.

Dr. Francis Reder, St. Louis, Mo.—I am nearing the end of my obstetrical work. I seldom do obstetrics any more. But I could never quite convince myself that I had made a satisfactory examination by rectum. I am something of a rabbit hunter, and when I go after a rabbit I go right after him in the hole he is in. At one time I was very active in obstetrical practice, and I must say that sometimes it was a difficult matter satisfactorily to demonstrate to myself the proper position of the fetal head. I had to find the ears that I might be able to define the correct position of the head. I may say in regard to the rectal and the vaginal examinations that it depends upon how many examinations you are going to make. If you make one examination and it gives you the information desired, I should give the vaginal examination the preference. But if you make an examination every time the woman has a pain, it will be better to put your finger into the rectum to determine what progress she is making.

Dr. George F. Wilson, Charleston, S. C.—I do not make rectal examinations of all my patients, but I train my nurse to make them. I generally have my diagnosis, made by palpation before the woman goes into labor, and in practically all cases I am right. I think the woman properly prepared in the hospital, with very few examinations, runs little risk. I know of no case of infection following vaginal examination by myself. If every one makes vaginal examinations there may be trouble. Rectal examination is best and we ought to adopt it more than we do. I seldom make more than one examination, a great deal of the time make none, but I do use the nurse rectal examination a great deal.

Dr. T. B. Sellers, New Orleans, La.—I agree with Dr. Lankford in his method of rectal examination.

It is gratifying to know that you have not made a number of vaginal examinations on a case when it is necessary to apply forceps or do a cesarean section.

Dr. John M. Clack, Rockwood, Tenn.—Just one word about the treatment of eclampsia. As I understand it, the Doctor prefers to dilate the cervix forcibly, possibly with the fingers. In serious cases where we have eclampsia with an undilated cervix, in a woman at full term, the quickest, cleanest, most conservative thing is to do a cesarean section, keeping out the forceps and dilators and all that kind of thing. Forceps and dilators cause more traumatism, infection and salpingitis than cesarean section. If there is sufficient evidence of a successful spontaneous delivery, the radical procedure is unwarranted.

Dr. George C. Mosher, Kansas City, Mo.—There is one point where these two papers come together. In a borderline case with a long, hard cervix, undilated, in an eclamptic, provided the woman has had only rectal examination, cesarean section is unquestionably the thing to do. The question of doing a cesarean on a woman who has had indiscriminate vaginal examinations is simply to put in confusion the question as to which cause will be responsible for her death. It is of course generally the indiscriminate examinations which are made before the cesarean was attempted. While cesarean section has become too popular in the last few years, I feel there is a wider field for its performance than simply pelvic dystocia. But we cannot do a cesarean with impunity on a subject who is already contaminated by frequent examinations. But in those eclamptic cases where there is a long, hard cervix, undoubtedly a clean cesarean is the thing to do without unnecessary delay.

Dr. Lankford (closing).—In answer to Dr. Reder, there was a time when most obstetricians delivered a woman under a sheet, but we have gotten away from that. Sometimes you cannot get along without a vaginal examination, and I am not afraid to make a vaginal in the proper way. But we have another method which we can use without going into the vagina.

The question of abdominal palpation was beyond the scope of my paper.

Dr. Newman (closing).—I agree with Dr. Mosher that we are now doing too many cesarean sections. Knipe and Donnelly studied a series of 83 cases of eclampsia in the Maternity Hospital in Edinburg, over a period of five years, and they came to the conclusion that the mortality is at least one-half less if we treat them medically than by any radical operative treatment. The consensus of opinion now all over the country is to treat these cases medically. A primipara with a small pelvis and a long, rigid cervix, having severe convulsions at frequent intervals, unconscious between them, and labor absent is a case for a cesarean. But without these indications even if the woman is in convulsions, treat her medically, and if labor takes place let it take its course. Of course we always try to shorten the second stage of labor, but do not do a cesarean section unless it is clearly indicated. I did not write this paper for the benefit of the specialist, but for the general practitioner who is doing obstetrical work.

THE TRAINED NURSE IN OBSTETRICS*

By William T. McConnell, M.D.,
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To those who are familiar with the obstetrical literature of the past year or so, it must be apparent that there are very gratifying signs of a decided forward movement along the lines of better care, safer procedures and more skillful and efficient technic in behalf of the expectant mothers of America.

Among the chief reasons for this awakening is the growing recognition of the fact that this country stands fourteenth in the list of the sixteen leading civilized nations in maternal mortality from childbirth; that the records show that during the past twenty years the maternal death rate shows no decrease; that according to authorities 20,000 women and 75,000 babies perish each year in the United States alone from lack of proper care during childbirth; that according to the U. S. Census Bureau, 45 per cent of all maternal deaths are due to puerperal infection, and 25 per cent to eclampsia, 75 per cent of all maternal deaths thus being due to largely preventable diseases.

It seems small wonder, then, that the medical profession should bestir itself to rectify a condition like this. If it were brought to our attention that each year in the United States some city of 100,000 souls were completely wiped out, and that the prevention of this calamity lay in our hands, we would certainly manifest an enthusiasm characteristic of our calling in removing from our midst this waste of human life. So will it be in the obstetrical field. As soon as we become thoroughly cognizant of conditions, concerted action will find and apply the remedies.

Foremost in importance in these matters is the care, supervision and close observation of the patient before, during and after confinement. The physician may give these patients valuable aid in the matter of instruction, management of the case, and careful and skillful deliveries; but the great burden of responsibility does and will continue to fall upon her who has the direct care of these patients, the nurse. And upon her degree of faithfulness, skill and training depends immeasurably the safety of childbearing.

While the vast majority of mothers and babies pass through this period safely, many of them under conditions which the breeder of thorough-bred stock could ill afford to chance with the birth of his valuable animals, yet no human mother enters this vale without the potentialities of disaster. She always deserves our very best efforts in her behalf.

Of course the ideal arrangement in the matter of nursing would probably be to have a graduate nurse in constant attendance upon the mother at least from the onset of labor to the end of the lying-in period. (In referring to the "trained nurse" in this paper, we mean the graduate, registered nurse, in contradistinction to those whose training is not completed.) Yet in view of the number of babies born each year compared with the total number of graduate nurses, if each nurse did nothing but obstetrical work there would be only enough nurses to supply a very small per cent of these cases. Besides this, only a very small per cent of graduate nurses will consent to accept obstetrical cases. Then, further, the vast majority of people who are having babies just now are financially unable to employ a trained nurse, if one were available.

Therefore, it becomes apparent that if our mothers are to receive the care they should have, we can depend upon the graduate nurse in private practice to only a negligible degree to fill this need. In fact, we can be assured of her valuable services in only a very small portion of our abnormal cases, especially in rural districts. And it follows that upon us will fall the responsibility of providing practically and adequately for our obstetrical nursing.

Among the various plans proposed and in some degree of operation, are the following:

(1) A campaign of obstetrical education; teaching expectant mothers what things make for their safety.

*Read in Section on Obstetrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

(2) The development of social service and public health nursing along obstetrical lines.

(3) The training of practical obstetrical nurses.

(4) The multiplication of prenatal clinics where nurses may, under the supervision of the obstetrician in charge, keep these patients under close observation, both in rural and urban communities.

In order to get a concrete idea as to the views of the physicians upon some of these questions, and to determine something of the importance attached by the average physician to safe obstetrical nursing, I sent out a questionnaire containing eight questions to fifty Louisville doctors, including the general practitioner who accepts obstetrical cases as well as those who make this work more or less a specialty. The enthusiasm with which these men answered indicates that they are thinking seriously along these lines. These questions follow, with a short summary of the answers:

(1) What per cent of your obstetrical cases have special trained nurses?

The answers give an average of 27.5 per cent, but from their answers it was apparent that some of them included the trained practical nurses. Allowing for the fact that these are all physicians practicing in the city, and many of these cases are abnormal, it would leave a very small per cent of normal cases over the country at large enjoying trained nurse privileges.

(2) What per cent of these cases having special trained nurses are in infirmaries?

Sixty per cent are in infirmaries, where the special nurse is needed the least. This indicates that very few home deliveries have trained nurses.

(3) Would you prefer the trained nurse or the average practical nurse in your obstetrical work?

Ninety-three per cent prefer the trained nurse; 7 per cent the average practical nurse. About 25 per cent express a preference for the practical nurse if trained by the physician himself or having some hospital training in obstetrics.

(4) Do you think the average practical nurse is safe and competent for home obstetrics?

Sixty per cent say she is not; 40 per cent say she is, but many of these qualify their answers by adding "if she is properly trained."

(5) Is the nursing end of obstetrics being cared for by the present system to the best advantage to the greatest number?

Eighty-seven per cent believe it is not, and 13 per cent feel satisfied with present conditions.

(6) Or do you feel that under the present system it is only the more well-to-do patients (outside of infirmaries) who have safe and competent nursing in obstetrics?

Eighty-seven per cent agree that only the well-to-do can have adequate nursing outside of infirmaries. One man states that he has difficulty in securing trained nurses even for the wealthy homes.

(7) Do you feel that there is a need for a nurse trained in a shorter course, teaching obstetrics and allied subjects exclusively, receiving less remuneration than the regular graduate nurse, and having recognized standing?

Ninety-six per cent say there is need for such a nurse, and most of them say so emphatically. Some would regret to see the fees lowered. One man, in suggesting a shorter course, teaching intensively, for all trained nurses as the best plan of relief for the nurse shortage, calls attention to the fact that it takes 4 years of 8 months, or 32 months, to make a physician; and 3 years of 12 months, or 36 months, to make a trained nurse. One man suggests admitting only women over 35 years of age to such shorter training.

(8) In your opinion, could the "Public Health Nurse" or the "District Nurse" features be developed so as to give those in moderate circumstances the competent nursing they should have? If so, how?

This question brought forth the greatest amount of discussion of any. Among the suggestions which seem the most practical are to the effect that nurses be provided by these organizations to accompany the physician to every home delivery; that nurses be provided who can be secured for a nominal fee, who will care for several families at one time, making both morning and evening calls, and being

completely removed from the charity feature, employed directly by the family; that the public health nurse doing obstetrical work should do nothing but obstetrics, that she should go from no contagious cases to the obstetrical cases. Ten per cent of those answering feel that these features of nursing hold no beneficial possibilities whatever.

A questionnaire of five questions was also sent out to fifty graduate nurses, as follows:

(1) Do you care to accept obstetrical cases? If not, why not?

Only six of the fifty written to answered that they cared to take this class of work. The objections given are that it is too hard work for the amount of money; or that too much time is lost in waiting for women to be delivered. Some simply do not like this class of work, not giving any reasons.

(2) What per cent of your work is obstetrical?

Those taking obstetrical work give an average of 40 per cent.

(3) What per cent of your obstetrical work is in infirmaries?

All answers give 100 per cent. This shows what chance the woman in the home has of securing trained nursing, even though she can well afford it.

(4) Do you feel that obstetrical nursing could be practically and competently done by nurses trained in a shorter course, teaching them obstetrics and allied subjects exclusively, and in their work receiving smaller remuneration than the graduate nurse, yet having recognized standing? If not, why not?

The answers are, with one exception, emphatically "no!", and that one feels that there is need for such a nurse, but the plan would not be practicable with the present state laws. The reasons given why it could not be done are that a nurse trained by any shorter course would be unable to recognize complications; would not appreciate surgical asepsis; that diseases having no connection with obstetrics may develop in the obstetrical patient; and that nursing standards would be lowered.

(5) The same question was asked concerning the public health nursing as was asked the physicians, and about the same answers received.

As conditions stand now, the greatest work of the trained nurse is being done along prenatal lines. This work is essentially educational and is best accomplished by the direct personal contact with the trained worker in the patient's home.

In the larger centers of population the prenatal clinics are doing a splendid work in preventing the more serious complications of pregnancy. Dr. F. W. Rice, of New York, states that during the past three years in Bellevue Hospital they have not had eclampsia develop in patients who have been under observation in the prenatal clinic, while they still see many eclamptic cases in women admitted without prenatal care. This is our experience in the Louisville Public Hospital. In our prenatal clinic, under the supervision of Dr. Alice Pickett, up to October 1, past, we had enrolled over 1500 women during the previous three years, without a single case of eclampsia, while we have many cases admitted to the hospital in convulsions who have not been under this supervision. And our experience also is that without the help of the trained nurse in going into the homes of our patients, in their educational and follow-up work, our clinic would fail miserably.

In the rural districts of Kentucky a very effective plan of operation is being pursued. The public health nurses are sent into each county, where they institute means for the care and instruction of the expectant mothers of that locality. And while an effort is made to organize clinics wherever possible, yet the nurses are finding that their most effective work is done in the homes of the patients. They are instructed as to the hygienic mode of living, are urged to consult a physician early during pregnancy, keeping in close touch with him throughout the period of gestation, and are trained in the prompt recognition of dangerous symptoms. The names of these women are forwarded to Dr. Veech, Director of the Bureau of Child Hygiene, who sends each of them a series of eight letters, covering all the important phases of prenatal care. These nurses are meeting with some opposition, active as well as passive, on the part of

many rural physicians. There seems to be marked reluctance on the part of the physician to revise his methods of obstetrics to meet the standards raised by the nurses. But the final result will be that through her efforts these patients will learn to consult the physician for prenatal care and examination. More careful deliveries will result; more babies and mothers will be saved; the fees for obstetrical work will be better; and the whole system will be raised from the plane of midwifery to a level in keeping with the safety of the mother and child, all of which will work out for the ultimate good of the physician as well as the patient.

There is probably no one time or place in the whole range of activities of the trained nurse when she is more needed, or where her help counts for more in the saving of human life than in the delivery room. Who of us cannot recall the times when our battles would have been lost but for her trained and timely aid; and who of us has not felt that defeat could have been turned into victory could she have come to our assistance at the crucial moment. How many lives have been saved because of the sanitary and aseptic deliveries made possible by her presence? Realizing these facts, as so many of us do, it is our great aim and desire to have the help of a trained nurse at every delivery. Of course, one of the surest ways to secure for our patients adequate partum and post partum nursing is to conduct our deliveries in well-regulated hospitals. But it will be many years before any large per cent of babies are born in these institutions. Those who make a specialty of obstetrics are following this course to a large extent, but the great majority of births are not conducted by specialists; quite the contrary, in fact.

In several of our cities the public health nursing department furnishes a trained nurse to go with the obstetrician to his home deliveries. This system works splendidly when the physicians become educated to the importance of such a provision. New Haven, Conn., has such a plan, which is said to be very successful. In several localities this has failed because of lack of interest on the part of physicians.

In the post partum care of our patients the work of the trained nurse is also important. In many abnormal cases her work is indispensable. In normal cases her help is certainly valuable. We can but deplore a condition of affairs which produces such a shortage of trained nurses as to deprive so many of our patients of the efficient care they might otherwise have. The early recognition by the nurse of danger signs in mother and child, the safe care thus assured, the instruction of the mother in her after-care of the baby, and the correct carrying out of the physician's orders, have saved many lives that are otherwise lost through ignorant and inefficient bedside care.

In January, 1919, a committee was appointed by the Rockefeller Foundation to investigate the subject of nursing education and to report back their recommendations. Their report was published in *The Nation's Health* for July, this year. They deal extensively in this report with the nursing shortage and recommend several revolutionary plans for its relief. They do not in any sense favor the lowering of the standards for graduate nurses. In fact, their plans clearly indicate a forward movement in this respect. They do, however, recognize the fact that because of this shortage and because of economic conditions, a vast amount of bedside nursing is being done by very incompetent persons. They say that since

> "the existence of this subsidiary (or practical) nursing group is a concrete fact, and in view of the valuable results to be derived from the services of this group in a definitely restricted field, it seems obvious that specific provision should be made for the training of workers of this type; . . . that steps should be taken through state legislation for the definition and licensure of a subsidiary grade of nursing service, the subsidiary type of workers to serve under the practicing physician in the care of mild and chronic illness and convalescence."

Possibly some such plan will help the obstetrician to solve his nursing problem until there shall be a sufficient number of graduate nurses to meet the needs, and until his patients can all afford to secure her services in all normal as well as abnormal cases.

Whatever plans are adopted for meeting these needs, the greatest success can come

only by the hearty cooperation of the nursing with the medical profession in working out and executing these plans. And when both these branches of our profession shall have fully awakened to the great and urgent need, then will be put into operation the means for meeting the situation adequately; then will the unborn citizens have their rightful chance, and the mothers their birthright.

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DISCUSSION

Dr. Edward Speidel, Louisville, Ky.—The obstetrical nurse surely deserves our admiration and our sympathy. In many states of the Union there is an eight-hour working day in force for women, but the trained nurse is on duty twelve hours, and the obstetrical nurse is on duty twenty hours, and her rest is broken from two to six times during the night. Her remuneration is not so good as the ordinary nurse, because even the wealthy refuse to a great extent to engage an obstetrical nurse from a definite date and pay her from that date. They expect to engage her from the time the woman is in labor. Consequently the obstetrical nurses are on duty only about six months out of the year, and from the standpoint of remuneration you can see it is not an attractive field. And if you hire a practical nurse you do not save much, as they are now demanding $20 to $25 a week. Consequently, I think the time has come to recognize that obstetrical delivery is as much a surgical operation as any abdominal procedure, and if we are going to save mothers and babies, if we are going to attempt such precedures as Dr. Pomeroy brought out, or even a dilatation of the perineum according to Potter, if we are to treat asphyxiation successfully, repair the perineum and successfully treat post partum hemorrhage, we must do it in a hospital. The public has been educated to the fact that surgical procedures must be conducted in a hospital, and it can be educated to the importance of obstetrical care in a hospital. Hence, it seems to me that the rational procedure in cities is to procure adequate and cheap hospital facilities for obstetrical cases. Under such circumstances the meagre number of nurses we have can adequately take care of a larger number of cases, and in that way at least there will be a beginning of a decrease in the tremendous mortality of women and children at childbirth.

Dr. George Clark Mosher, Kansas City, Mo.—The work of the ideal obstetrician is largely dependent upon contingencies and circumstances over which, to a more or less degree, he has no control. One of these conditions, of course, is this matter of nursing. In the *Saturday Evening Post* of last week is an article giving the economic condition and the income of the average family in forty cities of the United States with a population of from 5,000 to 40,000. These are not the families of laboring people, but they are clerks, superintendents and mechanics. These statistics showed the average income, including clerks in banks and other salaried men up to superintendents of small plants, to be from $60 to $175 a month. Now, while we want to idealize the nurse, as some one said here a few moments ago, the question that must be met is the matter of conditions, not theories, and the average family with an income of from $60 to $175 a month cannot pay $42 to $63 a week for a nurse. It is out of the question.

We appreciate the work of the nurse in obstetrics, and her endeavors add a great deal to the possibility of protection for the patient, undoubtedly reducing morbidity as well as mortality. But there is a large number of patients whose lives are equally endangered that do not have even adequate, ordinary care. Some provision must be made for nursing for the average family at an expense less than that for the services of the graduate nurse. We are doing something in this line in all of our prenatal clinics. A great majority of women even today have to be delivered without the service of any kind of nurse. It seems to me that while we are thinking of paternalism in government problems there might be some provision made whereby nursing could be afforded through welfare agencies, federal or state, by the average family and less than average family, and they might have obstetrical nursing at an expense to enable them to keep their self-respect and pay something for the service. Just how this is to be worked out is one of the important problems that we might try to consider.

Dr. H. A. Davidson, Louisville, Ky.—I think stress should be laid upon the fact that all obstetrical cases should be hospitalized. In the cities this can be done better than in the country. In the cities the poorest patient can go to a charity hospital, and, as you know, the charity patients today usually get better service than the middle class patients who have not very much money, but still have too much pride to go to a city hospital. The latter patients can go to an infirmary and into a ward and have the attention of the floor nurses. Other patients with a little more money can go into a private room and have a floor nurse, while the rich patients, those who are able to pay well for service, can go into an infirmary and have special nurses, two nurses in twenty-four hours. In this way the question can be solved in the cities. In the country it is different. Of course, that will be the last place where it will be solved properly. The same question will come up there regarding efficient physicians. As you know, the country now is having a hard time getting good physicians, and for the same reason the country women will have a hard time getting efficient obstetrical service. But in the cities this problem can be solved by educating the people to go to the hospitals. I think the city physicians should emphasize that point, that if a woman wants adequate obstetrical service she should go to an infirmary or hospital.

Dr. James R. Garber, Birmingham, Ala.—I have been interested in the question of the nurse in obstetrics for some time, and my status with the trained nurses in Birmingham has been one of war. I have on several occasions discussed a solution of this condition, and have one, about

which, I am like the parents of an only child, who think it is the sweetest, prettiest thing that ever lived.

There has been a little movement in Birmingham toward the hospitalization of these cases. There will be at the Birmingham Baptist Hospital a contract which will deal simply with hospital services independent of the medical services which so frequently go with contract work. I believe if other hospitals in Birmingham fall into line on this special contract they will be able to get patients to go to the hospital for obstetrical service and remain as long as necessary (because the fees are nominal), and then return home, where they can complete the puerperium, whether it is in the first or the second week.

I hardly know what the parliamentary procedure would be, but if a resolution could be gotten up that the Chair should appoint a committee from this Section to frame a resolution taking this particular problem of nursing directly to the Nursing Association at its next conclave, we might be able to accomplish something.

Conditions vary in different parts of the country, and I think the Section would be much interested in hearing from Dr. Pomeroy how this question is handled in New York and Brooklyn.

Dr. Ralph H. Pomeroy, Brooklyn, N. Y.—I am rather startled by the proposition that New York City can solve any such problem better than the hills and vales of Tennessee. We are absolutely swamped by a shortage of nurses and hospital facilities. The only thought I can bring into the matter is that hinted at by Dr. Garber, that it may be possible (as is believed in the Gary system of schools) that we are keeping our obstetric patients too long in our hospitals. I have experimented in the upper classes in regard to that feature by frequently sending multiparae home from the hospital on the fifth day, in a private ambulance, with the nurse and equipment. Very many of these multiparae could be taken care of after the fifth day very efficiently with the simplest form of nursing. We are actively considering such a method of utilizing more efficiently our hospital equipment in the large cities.

Dr. George J. Dempsey, New Orleans, La.—In Louisiana obstetrical nursing is a very serious question. Many of our best families engage the services of a midwife.

This we are trying to overcome through institutions, educational work, child welfare, Red Cross and other obstetrical organizations. In the parishes we propose to have schools for teaching obstetrics through the welfare nurse. We have had laws passed, but have not been successful, because trained nurses will not handle these cases so reasonably as a midwife, and physicians will not do so without a reasonable fee. In Louisiana we have a registration law for midwives, and 210 midwives have registered for 1922.

We have 2,029 women practicing midwifery that are not registered; so you can readily see what we have to contend with here. The laws are not retroactive. The Board of Medical Examiners has taken up this matter and will prevent some of these women from practicing midwifery. A questionnaire is now being sent out to the medical practitioners in some sections as to the capability of the midwife and if they should be allowed to practice.

Dr. Burnley Lankford, Norfolk, Va.—Of course the most important thing is hospitalization, but even in New York the recent statistics show that 56 per cent of the women are delivered by midwives; approximately 20 per cent go to hospitals, and 25 per cent are delivered at home by physicians.

We cannot give up the trained nurse. We physicians who do obstetrics know we are bound to have her, that we cannot do without her in many cases. The reason she does not want to do obstetrics is, first, the delivery, and then the twenty-four hours she has to be on duty. One reason the physician cannot take the poor class of cases that come to him is that he will not go into the hovel and take a dirty obstetrical case when he can do clean obstetrics in a hospital. It is impossible for all women to go to a hospital, and we realize that.

Dr. McConnell brought out one point in his paper that seems to me practical. If we could have in every community a committee of physicians approach the men who hold the purse-strings, the city fathers, and put before them the death rate as we have heard it today, perhaps they could be persuaded to employ a trained special nurse who would go with the physician to the cases that for various reasons cannot go to the hospital. The most important time is during delivery and probably a few hours after. That is when most of the accidents are liable to happen. If we had one or two nurses available, depending upon the size of the community, and if the poor people knew they could get such a nurse by applying one or two months beforehand, and if the physician knew he was going to have a trained nurse to assist him during delivery, we could accomplish a great deal by that plan. If that sort of thing were carried on throughout the nation, in ten years we should have a smaller morbidity rate and mortality rate. Of course the details would have to be worked out. Some patients could pay from one to ten to twenty-five dollars. Do not put them on an actual charity basis if it can be helped. It seems to me that is the line we shall have to follow, which will make both the trained nurse and the physician more valuable.

Dr. Walter E. Levy, New Orleans, La.—I am connected with the largest obstetrical clinic in the South, that founded by Dr. Newman, of New Orleans, but now incorporated with Touro Infirmary. I think we have solved the problem fairly well. We have a limited number of beds, and on the fifth or sixth day, or the seventh or eighth day in primiparae, if the woman is doing well we send her home in a private ambulance at no cost whatever. She is followed up at home by a graduate nurse, who is working under Dr. Newman's instruction. These are the white cases. Colored cases are handled differently. We have no facilities for colored cases, but we have arranged with a private colored hospital to care for colored abnormal cases. We have an obstetric interne on outdoor duty who delivers these colored cases, and we have three practical colored nurses who are trained in obstetrics. We also have four students on out duty. If a call comes in the first one sent out is the interne with a colored attendant,

and the case is delivered by the interne under the supervision of staff men. These colored attendants go each day and give the mother and baby personal attention, and every other day the graduate white nurse checks up. In that way I think we have pretty well solved the problem in New Orleans. We have gotten very good results. Dr. Sellers will tomorrow discuss our clinic in detail and give you some of our results. Our ante-natal work and our post partum work are carefully watched by physicians and by graduate nurses and skilled trained attendants.

Dr. George F. Wilson, Charleston, S. C.—Our method is practically the same, but almost 65 per cent of our mothers are delivered by the midwife. The midwife has been with us since the time of Moses, and she will be with us I believe forever. We cannot ignore her, we cannot get rid of her, so I feel the best thing to do is to educate her. Three years ago we started a system in my city, with the aid of the Red Cross, and we are giving these women twenty lectures a year. In addition, the Red Cross is teaching them about proper baths, how to take care of beds and how to care for babies. It makes you enthusiastic to lecture to these women in the Y. M. C. A. building. Usually 175 to 200 are present. They are eager to learn, and there has been wonderful improvement in the last two years. The first year they thought the physician had something up his sleeve, that he wanted to get their money; but when they found this was not so they came gladly. At the end of the year we give them a simple examination, and it is surprising how much these ignorant colored women and Irish white women learn. We give them a little certificate, and they think that is the greatest thing on earth. We get them to wear a uniform, and now the average poor woman will not have a nurse who does not have one of these certificates and wear a uniform. We expect to keep this up, and we want those who graduate to come back every year.

Dr. Basil M. Taylor, Greensburg, Ky.—Every man speaks from his own locality. I speak of the small town in the country. There never has been a time and never will be a time when the public will be financially able to obtain trained nurses. There never has been a time and never will be a time when there will be nurses enough to go around. This problem will never be solved until we men solve it ourselves. It is not cheering to hear these men talk about the percentage of women waited on in confinement by midwives. But as long as we men of the medical profession treat a case as indifferently as the midwife, why should they engage anybody but the midwife, who is three times as cheap?

The responsibility is with us. A woman engages us for confinement, and the only consideration we give her is, will she pay us when we are through? We never visit her. We do not know before we go there whether it is a breech or vertex presentation. We do not know whether her blood pressure is 120 or 220. No wonder the midwife gets the job.

It is no wonder the mortality rate in obstetrics is what it was thirty years ago. It is no wonder we lose three times as many babies every year as we lost soldiers fighting in the trenches. The cities have this problem solved, but what are we going to do in the hills and valleys? That problem is easily solved if the men who are doing obstetrics will realize that there is some responsibility in obstetrical work.

Every physician can find some intelligent, clean girl who is handy whom he can instruct in this work. That is what I did. I have the privilege of having a trained nurse live in my own home for three years, and that gave me the idea of what I had to do. I hunted up the cleanest girl in the community who had to work for a living and took her in my own home, and I talk obstetrics to her every minute she is not on duty. She does exactly what I tell her. The neighbors come in to see her work. It is contagious. Every one learns our methods in obstetrics. Obstetrical nursing is easy if you take an interest in it and make the community realize that there is something to it.

Dr. McConnell (closing).—The way to reach an ideal condition is through education. The medical profession must be brought to realize that obstetrics means something. The patient must understand the importance and responsibility connected with bringing a new life into the world. Hospitalization of obstetrical cases would no doubt be the ideal condition, and in the cities we have provided largely for that. The very poor can go to a public institution; those in more favorable circumstances and the rich can go into infirmaries and be delivered with all the care required. But there is a certain class who do not do it, and who deserve our consideration and sympathy.

The provisions of the Sheppard-Towner bill we feel will do a great deal toward helping the people and the physicians in the rural districts toward better obstetrics. Up to the first of November fourteen out of the sixteen states voting on this proposition have voted favorably for this bill. Forty-one governors have approved its provisions. It will take the nurse into the home in the rural district; the people in turn will become educated to the needs and dangers of obstetrics; the physicians will then be forced to hold their standards up to meet the work that the nurse will do. The nurses must have a greater place in this educational work than the physicians because they come into more personal contact with the patients.

As Dr. Speidel says, the private nurses certainly have their troubles when they go into obstetrics, but obstetrics is the only work that touches life at its fountain head, and it behooves us to institute plans, even though heroic, whereby this fountainhead of life may be protected. And while this education is going on, until conditions become ideal, let us try not to create the impression that only those in good circumstances should have children. It is the middle class who are bringing into this world a great deal of the population, who are giving to America its best citizens. Let us try not to create the impression that unless a patient can afford to have a baby with the same care and under the same conditions as an abdominal operation she should not have children. Let us use every means we have at hand for helping these people. Let us even in

emergencies call in the nearest neighbor woman and instruct her and do the best we can. Let us see that our personal technic is above reproach, and give our patients every chance for sane and aseptic delivery; and collectively, as a body of medical men, formulate some plan whereby these patients can have the care they really deserve.

THE DIAGNOSIS OF ACUTE ABDOMINAL CONDITIONS*

By J. M. Clack, M.D.,
Rockwood, Tenn.

The diagnosis of an acute abdominal condition brought about by disease or injuries of the abdomen is not at all times easy. It is not quite so difficult to say that an abdomen is or is not surgical.

Traumatic injury is capable of producing the greatest need for immediate diagnosis and surgical intervention. It is particularly proper at this time and place to consider the diagnosis of acute conditions of the abdomen arising from injuries, first, and secondly, those arising from disease.

For our convenience, the division of wounds of the abdominal wall may be classified as penetrating and non-penetrating. A differential diagnosis in every case is paramount. The general symptoms in cases of penetrating punctured wounds of the abdomen, with the exception of those due to profuse hemorrhage, furnish very little, if any, reliable information in the differentiation between simple penetrating wounds and penetrating wounds complicated by visceral injuries.

Severe shock may attend even a non-penetrating wound, and it may be absent or at least not well marked in cases of perforations of the intestine. There may be vomiting in either, or it may be absent in either penetrating or non-penetrating wounds. If pallor exists, and if there is a history of an abdominal injury of any magnitude, with acute anemia, and the physical signs of fluid in the abdomen, the diagnosis of internal hemorrhage will be confirmed by immediate laparotomy. Pallor is sure to exist following penetration and the surgeon cannot be sure that the bowel is not opened. Senn's gas test may have been used by some successfully, but as far as I am able to learn is obsolete. Disappearance of liver dullness is a valuable diagnostic symptom. Pain may be severe or slight, and even absent in some instances and therefore unreliable. Hematemesis, hematuria and the passing of blood from bowel movements are diagnostic points, but no one can wait for this if there be great danger in delay. Many fatal injuries to the abdomen have no external sign, such as laceration of the skin and muscles or contusion. When you have a history of a blow or kick from man or beast, or any form of traumatism to the abdomen without evidence of wall injury in sight, your careful consideration is as much demanded as if there were contusions or lacerations, provided you have the symptoms of internal injuries. Gun shot wounds, stab wounds, and others of the penetrating type, usually demand immediate exploratory incision to complete a diagnosis. The same is true in the non-penetrating injuries when there is shock, pallor, acute anemia, shallow respiration, feeble pulse, distended abdomen and pain. The milder cases, where many of these symptoms are lacking, should be under careful observation for several days before dismissal.

REPORT OF CASES

Case I.—D. N., age 45 years, while loading heavy timber on a wagon, was suddenly seized with great pain in the abdomen, which necessitated his removal from the woods to his bed. Dr. G. W. Gaines was called, and diagnosed locked bowel. Dr. J. A. Sewell and I assisted in opening the abdomen, and it was found that a slit tear in the mesentery had permitted a loop of intestine to go through the opening. The gut was strangulated, being filled with feces and gas. There was constriction at the tear in the mesentery. The opening was enlarged, the bowel released, and the operation finished in the usual way. There was no external evidence of injury to the abdominal wall.

Case II.—A. O., age 35 years, received an injury to the left lower abdomen by being struck by a plow handle. The plow was being dragged by a horse team, when the point of the plow met an obstruction, causing it to kick backward and downward. Dr. G. P. Zirkle saw him and made a diagnosis of rupture of the intestine, which we were able to confirm by operation at the hos-

*Read before the Southern States Association of Railway Surgeons, Auxiliary of the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

pital. There was no sign of external injury to the abdomen.

Case III.—J. P., age 14 years, received an injury to the abdomen by being accidentally knocked against a post in an iron furnace. Pain and shock were so great that ¼ grains of morphin were injected. The patient was put to bed. The temperature ranged around 100° following the injury, and after the relief brought about by the dose of morphin. There were no alarming symptoms detected during my daily visits to the patient. There was soreness and tenderness over a portion of the abdomen, but no contusion, abrasion or discoloration of skin. On the fifth day after injury, while the patient was sitting up in bed for his 6 o'clock evening meal, he suddenly collapsed and died within less than a half hour. There was no post mortem. The diagnosis is problematical.

Case IV.—M. M., age 15 years, while forking hay, received a severe strain to the muscles of the right side of the lower abdomen. He was confined to his room for about ten days on account of his injury. At this time conditions had developed which caused the family to send for me to see the boy. An enlargement over McBurney's point about the size of a small orange was the first and only abnormal condition found. It was plainly an abscess, but the location and frequency of abscesses occurring at this point made its origin debatable. Under general anesthesia at the hospital, the abscess was opened and found to be in the abdominal wall, and not of appendiceal origin.

Case V.—J. B., age 40 years, while in a fight, received a stab wound on the lower left side of the abdomen. There were no symptoms of peritoneal penetration, but under general anesthesia the wound was enlarged and the slight hemorrhage controlled. The peritoneum was not injured. While it might seem that I was unduly exercised about this case, it was the conservative thing to do, because it gave an exact diagnosis, which is advised in every injury of the abdomen.

Case VI.—C. W., age 18 years, in combat with another young man, received a stab wound in the median line of the abdomen two inches below the navel. Dr. Walter Clack saw him first and asked for me in consultation. We found the patient suffering from shock, pallor and considerable pain. No time was lost in doing a laparotomy in the poorest of surroundings and in the middle of the night. The stab wound was enlarged enough to make a thorough search for injury to the intestine. The knife had penetrated only the abdominal wall and the peritoneum. No other injuries were found.

Conservatism in every case of acute abdominal conditions caused by traumatism depends upon a prompt and exact diagnosis, followed by immediate treatment. The man especially fitted for this class of work is one who has trained as railway, mine, lumber camp and army surgeon, who will do his full duty under all conditions, never "passing the buck."

Let us take up acute conditions arising from disease. The appendix ranks first in frequency. It is estimated that it is responsible for about 75 per cent or more of all acute intra-abdominal conditions. Acute infections of the stomach, intestine, gall bladder, pancreas and the internal genitalia are of much less frequency. Early diagnosis of the acute appendicitis is of great importance as a life-saving procedure. That this statement has been made over and over again is well known to every doctor and to the majority of the laity. But as long as we continue to have late cases and death it is our duty to preach and practice early diagnosis. Early diagnosis of acute appendicitis, with early removal of the appendix, will cure nearly every case. Twenty-five to 40 per cent of the late cases operated upon stand a good chance to die.

Valuable points in the diagnosis of acute appendicitis are: The history of the case, rigidity of the right rectus and external oblique muscles, pain and tenderness at McBurney's point and nausea. The pain is in the flank in the retro-cecal cases. The blood count is of value, but not sufficient to make a positive or negative diagnosis. Pneumonia is occasionally the cause of error in the diagnosis of acute appendicitis, and the same may be said of pleuritis. The onset in these two diseases is sometimes most acute and pain in the side may be so severe as to cause rigidity of the muscles of the abdomen on the side affected. If it be the right, it is confusing. I have observed two such cases within the last year in consultation with good diagnosticians. The patient suffering from pneumonia was a child. It had sufficient symptoms, including rigidity. Fortunately it made a good recovery from the operation and pneumonia. The patient with pleuritis was an adult and developed empyema in the right plural cavity, necessitating rib resection. The patient recovered, notwithstanding the two operations.

The stormy period of acute indigestion is also confusing. In this event one should empty the stomach and wait for the lo-

calized symptoms in the right lower abdomen before making a diagnosis. Fever in the beginning of an acute attack of appendicitis is rarely, if ever, present. It is a late symptom. Acute perforations of gastric and duodenal ulcers may be the first symptom complained of by the individual suffering from ulcer, but there is usually a history of ulcer before perforation. The symptoms of pain, shock and board-like rigidity of the muscles of the upper abdomen are appalling.

When the gall bladder becomes acute there is tenderness under the right ninth costal arch and back. The pain frequently begins in the epigastrium and localizes to the right hypochondrium and epigastrium, sometimes with radiation to the right shoulder region.

The symptoms of acute hemorrhagic pancreatitis are sudden, violent pain in the central part of the abdomen, repeated vomiting, a rigid and tender abdomen, sub-normal temperature, rapidly progressive collapse, rapid and feeble pulse. To differentiate this condition from perforations is next to impossible before opening the abdomen.

Ruptured tubal pregnancy is not to be left out of the consideration. The valuable diagnostic points are acute anemia, pain, shock and a history of the case. Vaginal examination will aid materially in making out this condition.

Complete bowel obstruction from any cause is acute and the diagnosis is not attended with difficulty. Strangulated hernia is rarely overlooked. The femoral type is probably on account of its size and position, the least liable to attract the examiner's attention. Within the last year such a case came under my observation after having been overlooked by good practitioners.

A twisted pedicle of an ovarian tumor may give great distress.

Floating kidney with a twisted ureter may cause abdominal pain, nausea, vomiting and chills. Here the pain radiates in the line of the ureter. There should be a history of a movable tumor prior to the attack, and loin depression should be present in a considerable number of the cases.

Since the days of typhoid prevention, perforating typhoid ulcer is infrequent. The history of the infection in almost every case is available, and the diagnosis is not difficult. Exceptions are where the perforation of the bowel occurs in the ambulatory cases when the onset is abrupt.

In acute gonorrheal salpingitis you are always able to obtain evidence of gonorrhea elsewhere. The presence of bilateral pelvic peritonitis and microscopic findings of gonococcus are convincing.

Acute septic salpingitis usually follows abortion, labor and the use of dirty instruments in the uterus. The usual cause is staphylococcic or streptococcic. It may be unilateral. The onset is frequently ushered in by chill. The temperature rises rapidly and the pulse is high. A temperature of 102 to 104° and a pulse usually over 120 are the rule.

Many times in acute painful abdominal conditions the symptoms are masked by the administration of anodynes. This is always gratifying to the patient, but the diagnosis is usually rendered more difficult.

DISCUSSION

Dr. W. W. Harper, Selma, Ala.—At the last meeting of the Pediatric Section I reported a case of a young boy who was on his father's wagon, which was heavily laden with lumber, and who had fallen off and been run over by the bog wheel in the region of his liver. When he was brought in he was not in shock and there was no evidence of injury except for a slight abrasion, but I could not conceive of a six thousand pound wheel passing over the abdomen without producing considerable trauma within. Nothing was visible except the abrasion where the wheel had passed. I opened the abdomen and found it filled with blood. There was a rupture of the mesentery and this had ruptured the liver and the posterior peritoneum. We had great difficulty in arresting the hemorrhage, but finally succeeded in doing so and saved the life of the boy. If we had not opened the abdomen the boy surely would have died from the hemorrhage, and if we had waited until he was in shock that would not have served the purpose.

Now, about the medical cases, acute appendicitis and intussusception in children. When a patient gives the story of being awakened at night with a violent pain in the abdomen, the patient has been removed from the medical to the surgical ward and two things are necessary: we must omit all purgatives and opiates until the diagnosis is made. A patient with pain and nothing else means a surgical abdomen in the

vast majority of cases, and I believe it should be a penitentiary offense for a man to give purgatives with pain alone in the abdomen.

I recently had a patient, a young woman of twenty-two, with this history: She had had violent pain in the abdomen. Her doctor treated her for acute indigestion and when she came in thirty-six hours later he said, "There is no use to wait, for I have given her enough calomel and salts to drain the bile down." The abdomen was opened and was found to be filled with pus. She had a general peritonitis.

We should think of the appendix first when a patient starts out with pain alone. You have pain with pneumonia, endocarditis and with pericarditis, localized in the region of the appendix, but that is a different story. There is pain beginning with a high temperature and this should turn the attention of the surgeon to some other organ. A temperature of 102° F. never is appendicitis, I do not care how much pain is in the abdomen. In children how shall we make a diagnosis of appendicitis? In infancy you must make the diagnosis on the story of the mother, for you cannot make out the objective symptoms. The mother tells you the child woke with a pain and then vomited; went to sleep and vomited again. That story in 99 per cent of the cases means acute appendicitis. Remember that the appendix in infants is very long and is in the pelvis as a rule, and you will not get your tenderness and rigidity over McBurney's point, but in the rectum. Introduce a finger there and you will get the pain.

In the case of intussusception you must make the diagnosis on the story from the mother. You can make it a hundred miles from the patient. It is always the same story. It occurs from six months to two years. Here is the story: The baby woke up with a pain it had never had before. It had had colic, but never such a pain as this. Then the mother says, "It began to pass mucus, then muco-blood and then blood." Then you know what has happened. You have intussusception: violent pain, followed by mucus, muco-blood and blood. If you operate at once you can save the patient. If you wait, the patient will die.

Dr. C. Holtzclaw, Chattanooga, Tenn.—I was at the Mayo Clinic a week or two ago and saw a case of acute appendicitis. They had taken the blood count, etc. I asked: "What is the rectal temperature?" and Dr. McCarty, the pathologist, said: "I don't know. I didn't take it." If you take the oral temperature you find it 99.5° F., perhaps, but if you take the rectal it will be 102 or 103° F., and from that you make the diagnosis.

Dr. J. S. Turberville, Century, Fla.—I think we overlook a good many cases of gall bladder disease in young children. Very recently I saw a child with an acute gall bladder. Many of these cases we might mistake for pneumonia and wait. The symptoms in this case looked like gall bladder and we went in and found the bladder almost ready to rupture. In a case of horse kick it was asked me, "What shall we do?" The thing to do is to open up these cases and see what the trouble is. If the patient is in shock we cannot tell what is inside without opening the abdomen and making an examination.

Dr. Archibald E. Chace, Texarkana, Ark.—The question of cause and effect in abdominal injury is very interesting. We should consider carefully before we assign a definite cause for abdominal injury, especially where that cause is apparently insufficient. A man lifting heavy timber may get a strangulated gut in a hole in the mesentery. A man pitching hay may get some other abdominal injury which apparently cannot be accounted for by the mere pitching of hay. That is a very serious question in railroad surgery when we consider the very frequent claims for hernia. You have probably all read the small pamphlet gotten out by the American Railway Association on hernia by men of considerable reputation. We should all think very carefully before we assign a given cause for a given injury in the abdomen, and if we do there will be fewer claims for such injuries.

Dr. T. H. Hancock, Atlanta, Ga.—Two points have been omitted which I think it would be well to bring out. These are rupture of the spleen and of the urinary bladder. In a rupture of the urinary bladder we have inability to void. The pain is not constant and the shock is great. The diagnosis is easy when there is a history of trauma. If you catheterize the patient you will probably get several ounces of almost pure blood. Inject sterile water into the bladder and draw it off, and you do not get the same amount that you put in. I have known of several deaths from this condition which I think now could have been prevented. I have recently had a case in a young lady who was driving a car when it was struck by a train. There were two or three other girls in the car and one of them was killed. Six hours after the accident this girl was brought in and we carried out the details I have mentioned. There were no external signs of injury, no bruises or abrasions. I made an incision and after opening the fascia found the underlying tissues ecchymosed for a considerable distance. There was a laceration through the bladder about an inch and a quarter in length at its upper and posterior portion. This was sutured and the abdomen washed out with eight gallons of saline solution and drained. Her people were very anxious to have skiagraphs taken, but the girl was very ill and I thought it was not advisable to move her to the x-ray room. I told them that I would rather have a live girl with a fractured pelvis than a skiagram of a dead one. She made good progress and ten days later we took her to the x-ray room and found her right pubis was fractured at both ends and the right ischium was also fractured. There was displacement of the fractures of the pubic bone, but not much of the ischium. This girl has made a good recovery and is now very anxious to walk. So far she is in a wheel chair, but I think she will get along well.

Dr. Jere Crook, Jackson, Tenn.—The truest conservatism in penetrating wounds of the abdomen is the most intense radicalism and that means operation as soon as we can get the patient into the proper environment.

As to the medical type of abdomen, I wish to emphasize this again: purgatives in the presence of an acute abdomen, especially with a diagnosis of acute appendicitis, are the submarine to Nature's defenses and the use of purgatives in these cases is criminal.

No medical meeting for many years will be complete unless there is a place upon the program for the things the Doctor has emphasized. We say the subject is old and trite. It will never be old and never be trite to the poor fellow who dies of appendicitis because of neglect on the part of the physician or the surgeon. Let us always emphasize this: that we can cut down the mortality from 10 to less than 1 per cent by early operation. We lost eleven thousand people by appendicitis last year and ten thousand of these deaths were not necessary. That is an indictment of somebody, and it is our duty to educate the people to the dangers of delay and the value of early operations in reducing the mortality of this disease.

Dr. W. S. Anderson, Memphis, Tenn.—One of the gentlemen in his discussion mentioned a case of gall bladder disease in children. I saw recently a child of three with a gangrenous gall bladder. She was operated upon and made a good recovery.

It is criminal for anyone to give purgatives in appendicitis, and I think we might say the same thing in cases of intestinal obstruction; for in these cases we only increase the kink and add fuel to the fire.

As to the traumatic abdomen, just now we are all interested in football and we all run across these traumas to the abdomen such as we meet in railroad work. I recently saw a case that simulated appendicitis with peritonitis, but there the history, which is very important, gave us the diagnosis. We examined the urine carefully and found some red cells and there were some signs of rigidity over the lumbar region. We watched the case carefully and within a few days there was a localized hematoma of the kidney. We cut down on it, drained, and the patient recovered nicely.

Dr. Lucius E. Burch, Nashville, Tenn.—If I may be pardoned for speaking from the Chair, I should like to bring before the Section one procedure that is occasionally applicable in cases of acute traumatic conditions within the abdomen. This procedure is not demanded in a large number of cases, but in those cases where it is demanded it may be the only means of saving a life. It is autotransfusion, or reinfusion, the reinjection into the patient of his or her own blood that has been lost either from traumatism or from some pathological condition. It is especially useful in cases of rupture of the spleen, liver and in ectopic gestation, as well as in cases in which a large amount of blood is lost during an operation. I used it recently in the removal of a spleen for Banti's disease. The spleen was large, quite vascular and with many adhesions. It was impossible to control the blood until the pedicle was reached, which, of course, took some time. Sponges were placed around the spleen and after its removal the blood was expressed into the citrate solution and reinjected into a vein of the elbow. About a quart was recovered. The patient's pulse was 150 at the beginning of the transfusion and at the completion it was 104. There was no reaction and the patient was able to leave the hospital within two weeks.

I suggested this procedure in this city in 1920, during the meeting of the State Society. I thought at that time that I was suggesting something new, but I find that the Germans have been using auto- or re-infusion since 1914. I was able to collect 162 cases from the German literature, one from the French and one from the Italian.

If a citrate solution is not available, saline will form an admirable substitute, and in a number of the German cases no solution was used at all, as it was found that the blood will not clot very rapidly. It has been recently discovered that a prolonged ether anesthetic changes the patient's blood group, and for this reason it is impossible to select a donor for the patient before the administration of ether. This makes autotransfusion a valuable procedure. In the few cases in which I have employed it I have been much impressed with its usefulness, and while I realize that it will never be applicable for a large number of cases, at the same time it may be the only means that one will have at his command to save the hundredth patient.

Dr. C. N. Cowden, Nashville, Tenn.—It is an idea among the physicians and the laity that if a man has a pain in the abdomen it calls for a purgative. That idea is as common as can be. One type of pain demands and calls for a purgative, but in the others it is criminal to use one. The pain in the belly attended with a mycotic diarrhea should have a purgative, but unless you have a diarrhea all purgatives should be withheld. I believe the time is coming that when a doctor brings a patient for operation and says he has given salts and calomel and everything of that kind, we shall tell him that he has taken away almost every chance in the world of saving that patient's life. Doctors have heard this statement over and over, but they somehow will not heed it.

In regard to traumatic conditions, we cannot rely upon the shock to lead us aright. I would like to cite two cases very briefly. Two boys were out shooting with a little BB rifle. They were shooting at everything and happened to shoot a negro through the band of his trousers. He fell down and went into collapse. He felt the sting of the bullet and when he was brought to me his face was ashen. He vomited a little bit and I thought he would be dead in a few moments. We opened his trousers and there was the little bullet that had just gone through the band of the trousers and slightly injured the skin.

Last summer in my service at the hospital a negro man was brought in. He would not consent to be carried in, but walked and resisted all efforts at operation for a while, although he had a gunshot wound just at the left of the umbilicus. His pulse was normal, the temperature was normal and to all intents and purposes there was nothing much the matter with him. However, he had such a large opening in the abdominal wall that we insisted on opening the abdomen. We finally got his consent and found that he had six perforations of the intestines. We made a long resection, but the man died promptly. We cannot rely at all on the amount of shock that we have in such cases to direct us.

Dr. Samuel M. Scott, Oakdale, La.—I am not a surgeon, but am not in favor of opening an abdomen just for pain. Recently a nephew of mine, a teller in a bank, rushed into my home with a terrible pain in his abdomen. It was located at McBurney's point and the abdomen was rigid. We called a consultation and the surgeon was sure that it was an acute attack of appendicitis. He advised an operation, but I felt that we should wait a few hours, as he had no temperature or nausea. After he had a hypodermic and an ice pack over his appendix for three or four hours with no relief, he walked up stairs and lay down on another bed, following which he became comfortable. The analysis a few hours afterward showed blood in the urine and an x-ray examination showed a renal calculus in the ureter about two inches below the right kidney which was removed later. It would have been a mistake to make an early operation in this case.

I had an experience also with one of my children while in a city some distance from my home. She was taken very sick and I took her immediately to a hospital and called a consultant. She had nausea and vomiting, pain in the abdomen and rigidity. Diagnosis of cholecystitis was made and one surgeon advised opening the abdomen. I knew she had eaten some shrimp and felt quite sure that it was due to this. After a period of twenty-four hours the child was much better and after a dose of castor oil had acted well she had a complete recovery. She has eaten shrimp twice since with the same result as the first time.

Dr. Clack (closing).—The subject has been so well covered in the discussion, it seems unnecessary for me to say anything further. I could not go over all of the abdomen in fifteen minutes and it was not possible to take up all the points leading to a diagnosis of acute abdominal conditions in the limited time for a paper. The urinary bladder was not mentioned in the paper. I thank Dr. Harper for bringing this subject up and giving us the proper procedure for a diagnosis of rupture of this organ.

SERVICE WITH LOYALTY*

By H. T. Ballantine, M.D.,
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That it will appear presumptive to come before this body of medical men to read a constructive critical paper on a subject of which we are the living embodiment, I will at once concede, for both service and loyalty have been our watch words since time immemorial. And to attempt to further enlighten the casual thinker upon these two virtues as applied to the physician may seem as useless as carrying coals to Newgate, gilding the lily, or any one of a dozen other useless or impossible tasks that history and tradition give us for comparison. But to the chief surgeon busy with endless detail, harassed by failure to receive needed data, chagrined and embarrassed by his inability to grant all requests made upon his department, there comes daily an almost overwhelming desire for closer contact with his local surgeons, that he and they may know the problems that confront one another and be of mutual assistance in their solution.

For that purpose, I address you upon the subject of service with loyalty.

After a close study of this matter, both from the angle of the local surgeon and that of the chief surgeon, I find that there are three broad divisions along which the local surgeon's service should be directed. That he must be loyal in all of them goes without saying.

First, service to his road, and this embraces employers and employees alike, for, regardless of what the method of his compensation, the local surgeon is, after all, the servant of the entire road.

Second, service to his chief surgeon.

Third, service to himself.

It will be my pleasure to discuss these divisions as outlined.

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*Read before the Southern States Association of Railway Surgeons, Auxiliary of the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

First, Service to His Road.—Upon accepting the local surgeonship of any railroad, the physician obligates himself to perform certain duties pertaining to that position. These duties may be clearly set forth in the form of a contract or they may be only those intangible things that are sensed or taken for granted.

However that may be, it is not enough that he give a prescription to this man, or dress the injury of that, or that he see to it that his reports go forward to headquarters at certain regular intervals. But, and here is where his loyalty enters, he must literally look upon that road with the fanatical pride of the fond father whose first-born may be cross-eyed, tongue-tied, knock-kneed and resemble his maternal grandmother, but is his very own son, and being his, can have no equal, past, present, or in the future. The road served by this local surgeon may have the worst service, the poorest trains, and be in the bankrupt courts, but it is part his, and he is part of it, and this being so, no Sunset Limited or Golden Gate Express can compare with it. Enthusiasm? Yes, but all loyalty must be compounded equally of enthusiasm and service.

The local surgeon serves his road in many and divers ways. His contact with people, both in the employ of the road and out of it, is constantly a knock or a boost. Hardly a day goes by but I am asked, "Who is your local surgeon at such and such a place?" Upon learning the doctor's name, my questioner almost invariably adds a criticism or a commendation. In selecting men to fill these positions along the line, much more thought is given to each man's particular fitness for the place than the average individual realizes. But perhaps the greatest service the local surgeon can render the road he serves is in the daily contact with the men whom he meets in his professional capacity. Here, undoubtedly, he proves his worth, or the lack of it. Sick men and women, or those in pain from any cause, are never calm in judgment, and the surgeon can many times relieve a mental worry and relax a nervous tension by reassuring the injured or sick employee that the road is interested in him as an individual; that his superior is anxious to have every attention given him within the power of the hospital department; and that everything will be done to have him again at his work at the very earliest possible moment.

Unfortunately, in the past employees have felt aggrieved that the attention given them was not only mechanical, but was the least possible in amount. The result was there grew in the minds of many of them a suspicion of the interest and motives of the road and of its hospital department as well. We have heard the men say, "Oh, he is only a railroad doctor, and will give you only calomel and quinin that he dopes out to everybody. Why don't you go to a real doctor?"

It is my belief, owing to a closer relationship all along the line, that this feeling is largely dying out, and the men believe they are getting every necessary attention, and that the service received is both personal and specific. I know this is true on our own road. And to further this feeling it is my constant aim to see that the employees who come to my own office, as well as those seen by the local surgeons, have the same prompt, efficient attention as our private patients.

Second, Service to the Chief Surgeon.—It may seem a very trivial matter to the average local surgeon that a section laborer with a broken leg has been sent a hundred miles to the hospital, to find upon arriving there no arrangements to take care of him at the depot or to transport him to the hospital, or to have the leg set and made comfortable after entering the hospital. All this is because the surgeon did not carry out his instructions to so notify the hospital department. The whole machinery has been thrown out of gear, the employee made to suffer unnecessarily, and many times to bring charges against the hospital department for inefficiency, when the only real inefficiency traceable to the department was in having such a local surgeon upon the rolls. Likewise, it may seem to him relatively of no importance that his own reports have either not been compiled accurately or have been sent forward late, and often so late that they cannot be itemized for the month sent,

and so make additional work in the month following for the recording clerk. But they are of very great importance to the smooth running of the machinery as a whole. The effect of these failures manifests itself all along the line from the recording clerk to the auditor and often back again to the surgeon himself, who finds his monthly voucher delayed, or transportation requested not arriving on time, and any one of a dozen other petty annoyances.

I doubt very much that the average local surgeon thoroughly realizes the importance of his injury reports, both as to their accuracy and the promptness with which they go forward to the chief surgeon, later to be transferred to the legal department. But perhaps no phase of his work outside of his professional duties should receive the prompt careful attention that this should, for so often upon these reports depends justice both to the injured employee and to the road. That a failure to carry out instructions as outlined above might be a lack of service, I think almost all of us will agree, but that they carry an element of disloyalty to the head of the department, many of us will question. However, there can be no question of the lack of loyalty and cooperation on the part of any man who has been repeatedly requested to conform to certain regulations and persists in his failure to comply with them. This spirit of disloyalty exists, whether the cause be one of carelessness, lack of regularity in office, or gross lack of desire to cooperate.

Third, Service to Himself.—That any man accepts the arduous tasks that befall the local surgeon for purely altruistic reasons I very much question. Since it is conceded that the hope of a certain definite gain is the actuating motive for accepting this position, it follows that each man should derive every benefit to which he is justly entitled. Many of them, I feel sure, never attain this, a fact that may be accounted for in many ways. Often the man himself fails to realize that, at least in the eyes of that particular road, he is considered the best available material for local surgeonship in that community. Or it may be that he fails to acquaint himself with all the privileges of the position and is neither impressed himself, nor impresses upon others with whom he comes in contact the fact that he has been honored by receiving the appointment of professional representative of the railroad traversing that section. Some of you may receive the statement that this is an important appointment to the man in the smaller towns with a degree of amusement, but if you talk with them concerning the matter I feel sure you will change your opinion. Again, the local surgeons are deprived of much of the benefits that should come from the appointment by the slowness with which the railroads, governed by the Interstate Commerce Commission, have recognized the importance of these positions. It is my belief that no employee of the road holds a more important position, or stands more ready to serve the road than the efficient, conscientious local surgeon. And I would respectfully urge this body of railway surgeons to go on record, to recommend and to work for more liberal perquisites for its local surgeons. And yet again I feel that the local surgeon, by his isolated position, ofttimes is deprived of much benefit that would accrue to him could he meet his fellow workers in a road organization similar to this, meeting at certain stated intervals, where the problems confronting the whole service and those concerning the individual could be thoroughly discussed for the benefit of all concerned.

It is my hope to perfect such an organization within my own service very shortly, and I feel sure that the road, the men and the hospital department will be greatly benefited by it.

DISCUSSION

Dr. Duncan Eve, Sr., Nashville, Tenn.—I was much interested in the paper and think the author very conservative. His views should hold under any and all circumstances. There is no question of doubt that the surgeons of a railroad are frequently among its best assets. There is no way of measuring the worth of the surgeon who is doing his full duty. He does more than the work he is called upon to do in attending the injured. They are looking after matters that do not concern them frequently. More particularly do I allude to the fact of their attendance

in courts. They are rendering a service which requires time, at the greatest sort of inconvenience because they are away from their work, frequently doing nothing but waiting to be called into court. Many of them are not paid for court service, but they should all be paid. As a matter of fact, the very decision depends upon the surgeon and his testimony. His service is of the greatest importance.

Then on what road is a surgeon not called upon to assist the claim agent in some compromise or some effort that prevents a suit? He is the first man called, occupying the dual relationship of representing not only the road but the patient, as a go-between, and under the circumstances he is the man who settles the matter out of court.

Dr. L. M. Anderson, Lake City, Fla.—We have a State Railway Association in my State and no employee of the railroad is twenty-four hours on duty, as is the local surgeon, night and day. We want a closer relationship with the railroad officials. We are the representatives in our community and, as the Doctor said, if you do not go at their beck and call there is an excuse, and if you go you hear, "He is a railway doctor and he will give us only quinin and pills." We had one case where a verdict of $25,000 was rendered. That went to the Supreme Court, and largely on the physicians' testimony it was reduced to $10,000. In that particular case $5000 would have been a big verdict, but if it had not been for the untiring energy and honesty of those surgeons the verdict would have stood.

Dr. J. A. Mitchell, Tullahoma, Tenn.—One of the duties of a railway surgeon is to assist the legal department in preparing its defense in medico-legal cases when such is needed. The plaintiff calls upon his physician or surgeon for help, and why not the defending company? By the physician's properly advising the attorney and looking up the literature for him, his work is made much easier and more effective in his examination, direct or cross, of the witness.

It is not wise to try to lead an attorney in giving evidence. Let him do that, for he knows what he wants and in his leading he will not get tangled. Thus we avoid spoiling his case.

It is much better not to know too much nor to be too keen to answer, and it is wise to use simple terms that the jury can readily understand. The opposing attorney will try to belittle our statements made on direct examination, especially if they are detrimental to his side of the case. He is likely to try all kinds of schemes to cross us up and, if we are not careful, he will make it appear that we have made two statements directly opposed to each other. On our cross-examination, if we cannot strengthen our statement made on direct examination, then our evidence will be of little value.

Dr. C. Holtzclaw, Chattanooga, Tenn.—The ordinary witness on the stand is too technical. He must put his testimony in terms the jury can understand.

Dr. E. T. Newsom, Sheffield, Ala.—My personal experience in the few railway cases with which I have been connected has been most unpleasant. There has always been some trouble with the local railroad surgeon of the railroad on whose lines the case originated. If the railroad surgeon fails to cultivate the employees of the railroad company that he represents or fails to give them what they term a square deal, and as a result of this failure the injured employee insists upon calling in an outside surgeon to care for him, it is the employee's constitutional right to do so, and the railroad surgeon should gracefully accept the situation and let the highest of professional ethics govern his speech and his actions, leaving out of consideration the legal and claim departments of the railroad.

I wish to give you this thought to carry back home with you or you may laugh it off here and now if you like. I believe everyone on the outside of railroad circles wants to cooperate with you. But in some instances it is made quite impossible to cooperate with you. I have had several patients who were passengers of the railroad, not employees, and, in one instance without ever taking the matter up with me, and without asking the patient's permission to call to see him, the railroad surgeon walked into the patient's room unannounced and insisted upon throwing back the covers of the bed, saying, "I want to see that leg of yours."

I have some records on injured employees where the professional ethics practiced are truly laughable.

Possibly I have been associated with different people from all of you. I hope I have. That which I am sure we all want is harmony between the railroad surgeon and the outside surgeon. If cases, as they arise, are handled with a proper regard for professional ethics first, and then attention is given to service and loyalty to the railroad company, after ethics have been served, I am sure strong and lasting friendships will grow up among people where enmity too often exists.

Dr. G. G. Dowdall, Chicago, Ill.—I think that all railroad surgeons wish to be understood to take the position that as representatives of the railroad they will offer their services to the patient only if the patient requests it. It is not proper for us as railroad surgeons to lose sight of the fact that the individual practitioners who are our neighbors are entitled to our first consideration.

The question of the relation of the physician to the railroad itself is very important. It is one that has been given much attention in the last ten years and it has helped to emphasize the importance of the local surgeon to the railroad company. It has also brought about a proper appreciation of the railroad surgeon, and it has helped the railroad manager to understand that the local surgeon is entitled to a proper compensation for his service. There has been a very material change in the attitude of most railroad managers in the country in reference to appreciation of the local surgeon.

I was greatly interested to read the other day that Henry Ford does not use the "glad hand" in his automobile factory. He says the employee works for the Ford plant for what he gets out of it. It seems to me this should be the position of any surgical or hospital department. It should be made worth while. The road should make it worth while to get the best men possible and to encourage their best service because it pays what is reasonable compensation. Mr. Ford says he does not use "policy" or attempt to interest the employee as to what is to the best interest of the company. If you make your employee satisfied because he feels that he is well paid for what he does, and then if you encourage his interest in his work by helping him with some of the problems that go into the management of the railroad, if you also encourage a more pleasant relationship by bringing the local surgeon into closer contact with the officials of the railroad and help him to understand their problems, the influence of the surgeon will be great in helping to solve the railroad problem, and that is to sell transportation to the public. The railroad surgeon is coming more and more into his own. The organization of state societies of railroad surgeons is of benefit. I think the railroads that have their own surgeons' association find it of great benefit. The most important thing on any railroad is the development of team work. The proper appreciation of the local surgeon by the company and the proper appreciation of his responsibilities by the surgeon will help him to show what he can do for his company.

Dr. William P. McDonald, Spring City, Tenn.—In my road, the Cincinnati Southern Railroad, operated by the Southern Railroad, we do not take a case or treat a case until we are called upon by some official to do so. If a man gets hurt we do not take it as a case for the Southern Railroad. I would render what assistance I could in such a case, but not as a railroad surgeon. If I find that the family wants some one else I try to smooth that over and get along as well as I can.

The witness stand for the surgeon is a great place. I heard a story about a fellow who came in and said, "Doctor, I want you to prescribe for me." The doctor said, "I would be glad to do so, but I cannot." "Why?" "Because you are the lawyer who had me on the witness stand the other day and I don't want to kill you and I don't want to cure you, and for that reason I must ask to be excused."

For the jury I always try to make everything as plain as possible, keep cool on the stand and stick to the truth whether it hurts my road or not. I have never yet found a disposition on the part of the lawyer representing the road to have me do anything different.

Dr. Ballantine (*closing*).—The perquisites granted are few and far between. The question of foreign transportation which would enable them to attend clinics and increase their education has been withdrawn since the railroads went back into private ownership. That is not true in regard to the legal department, however.

The question of the legal witness is one that gives us all great concern. I believe the time is past when the doctor is expected to stultify himself on the stand. No lawyer expects his witness to testify to anything but the truth. I think that has done more to bring the railroad hospital department into its own than any other one factor.

EYE, EAR, NOSE AND THROAT

LATE RESULTS FOLLOWING X-RAY TREATMENT OF CHRONICALLY INFECTED TONSILS AND ADENOIDS*

By Charles A. Waters, M.D.,
Baltimore, Md.

We first became interested in the problem of x-ray treatment of infected tonsils and adenoids soon after the publications on this subject by Murphy, Witherbee, Craig, Hussey and Sturn (*J. Exp. M.*, 1921, XXXIII, 815) and in September, 1921, we undertook the x-ray treatment of infected and hypertrophied tonsils with a view to determining (1) whether the same clinical results could be accomplished as in tonsillectomy and adenoidectomy, and (2) whether there was a persistence of the carrier state.

The results of this work were based on the records of 21 cases treated, but as the records are incomplete in 9 cases, discussion is limited to the results in 14 cases. All these cases were seen in the out-patient department of the Johns Hopkins Hospital and all of them were suffering from infected tonsils and adenoids.

Before the treatments were started swabs were taken from the surfaces of both tonsils and the nasopharynx and cultures were made according to the method of Bloomfield.

The distances between the two tonsils were measured and recorded by one person, Dr. J. W. Baylor, in order to minimize the source of error. The cases were grouped as follows:

Chronic tonsillitis, ten cases.

Sydenham's chorea with chronic tonsillitis, one case.

Chronic infectious arthritis with chronic tonsillitis, one case.

Chronic suppurative otitis media with chronic tonsillitis, one case.

Acute catarrhal otitis media, one case.

During the past year fifty more cases have been added to this series, and while the bacteriological data are incomplete, the clinical course following the treatments is sufficiently characteristic to warrant a statement. The following discussion, however, will be limited to the fourteen cases in which the records are complete.

Before entering into a clinical discussion of the cases it might be well to mention briefly the treatment technic employed. While we have not followed exactly the technic advocated by Murphy and his associates, we have adhered to the same general principles.

TECHNIC OF TREATMENT

One treatment consists of 5 milliamperes of current, filtered through 4.5 mm. of glass and a one-half inch layer of orthopedic felt employing 120 K. V. and a focal distance of 25 cm. for five minutes.

The above exposures were given twice a week for two weeks, making a total of four treatments in two weeks, which we termed one series of treatments. The patients were then allowed to rest for a period of three or four weeks before starting the second series of treatments which were the same as in the first.

While this is a larger x-ray dose than advocated by Witherbee, Murphy and Osgood, we had no bad effects. We did, however, have a few mild erythemas. Whether the good or bad results in our cases were due to too much radiation we hesitate to say, but surely it has not been the result of insufficient radiation. We have now altered our technic in so far as the time factor is concerned, the same factors being employed but for a period of only three minutes. Since cutting down the duration of exposure we have never had an erythema or dryness of the throat or any ill effect. We now feel that this is the ideal technic.

The treatments were given in such a manner that the perpendicular beam passed below the lobe of the ear, under and just posterior to the angle of the jaw. The entire body, with this exception, be-

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ing covered with a heavy lead rubber sheeting, while the parotid gland was doubly protected by a heavy piece of lead foil 1 mm. thick. The exposed surface area measured approximately 8 x 9 cm.

REACTION

Treatment

(1) Five cases had one series of treatments.
(2) Five cases had two series of treatments.
(3) Four cases had skin reactions after one series.
(4) One case had skin reactions after receiving two series.
(5) In no case was there atrophy of the parotid glands.

The adult patients developed a very faint blush after the first series, which lasted about one week. In the men patients there was some epilation of the beard. In the children a more definite blush or mild erythema developed after the first series, which lasted a trifle longer than in the adults, usually about ten days or two weeks.

All the erythemas cleared up in a few weeks, with no tanning or telangiectasis, the skin completely returning to normal.

X-ray plates of the jaws in every case showed no evidence of changes in the dental structures as a result of the x-ray treatments.

THE CLINICAL COURSE OF THE CASES

Chronic Tonsillitis, Ten Cases.—Ten of these cases were children under 12 years of age, who were suffering with chronic tonsillitis and hypertrophied adenoids. In each case the diagnosis was made on the basis of frequent colds and sore throats with occasional attacks of acute tonsillitis, the presence of enlarged tonsils and adenoids, palpable glands at the angle of the jaw and the absence of any general constitutional disease. Five of these cases had one complete series of four exposures, while the other five cases had two complete series, comprising eight exposures. The tonsils have appreciably shrunken in all but one case and the distances between the tonsils have increased as follows:

Five cases which had two complete series:

W. R.	6 mm.
C. S.	11 mm.
B. S.	6 mm.
E. H.	6 mm.
D. T.	5 mm.

Five cases which had one complete series:

R. C.	9 mm.
E. W.	5 mm.
D. N.	6 mm.
R. B.	No appreciable difference
P. K.	7 mm.

The general appearance of the cases which had two complete series was that the tonsils had shrunken to normal size, while in the cases which had only one series the tonsils showed a shrinkage nearly as much as those that had two series. A reference to the chart will show that in those cases in which the largest number of observations have been made the greater shrinkage took place about one month after the second series.

RESULTS

In these cases the clinical symptoms for which they came to the hospital disappeared, but during the past year eight of these cases have returned to the hospital for tonsillectomy, their symptoms having been only temporarily relieved. It is impossible to tell whether this apparent cure in some cases is due to the tonic effect of the x-ray treatment or whether it is due to lessened absorption from the foci of infection. At the conclusion of the treatments the glands at the angle of the jaw, which were enlarged on admission, were still palpably enlarged in some of the cases. The bacteriological results were completed in five of the cases which had two complete series and in three other cases which are to follow, the bacteriological studies being confined to these eight cases.

Sydenham's Chorea with Chronic Tonsillitis, One Case.—This case, H. C., a boy of twelve years, developed chorea three years before, following a severe attack of tonsillitis and joint pains. He had had more or less choreiform movements since that time. This was usually worse in the spring of the year. Examination

showed him to be suffering with chronic tonsillitis. He was given two complete series of treatments with the following results: Clinically the choreiform movements improved after the treatment was begun. His mother stated that she had not noticed any nervous twitchings since the treatment was begun, and he had had no colds or sore throats. There was a decrease in the size of the tonsils, so that the distance between them increased 4 mm. The hemolytic streptococcus was present troughout the first course, but absent throughout the second course of treatment. No cultures were made after the last x-ray treatment.

This case indicates one condition where roentgen-ray therapy would be extremely serviceable. In this condition it is especially desirable to relieve the patient from chronic focal infection in the nose and throat, and to prevent recurring colds and tonsillitis. Surgical operation in the acute or subacute stage of chorea may be a very dangerous procedure, for the operation may stir up an acute endocarditis, while roentgen-ray therapy would not do this.

Chronic Infectious Arthritis with Chronic Tonsillitis, One Case.—This case, B. T., a woman of fifty-six years, had had polyarthritis for fifteen years and had had frequent sore throats since childhood. Examination showed large, adherent, irregular tonsils and a moderate-sized mass of adenoid tissue, as seen by the nasopharyngoscope. The patient received two complete series of x-ray treatments, with the result that clinically the general symptoms and throat condition were very much improved. However, there was no measurable decrease in the size of the tonsils, and the hemolytic streptococcus was still present four weeks after the second series.

It will require many cases to determine the effectiveness of roentgenotherapy in removing chronic focal infection in tonsils that are giving rise to a general constitutional malady, such as arthritis, glomerular nephritis, etc. In view of the results, as brought out in the section on bacteriology, it would amount to malpractice to resort to x-ray treatment alone when surgical removal might save the patient.

Chronic Suppurative Otitis Media with Chronic Tonsillitis, One Case.—A. S., a boy of eleven years, gave a history of repeated sore throats and attacks of tonsillitis and a discharging ear since infancy. Examination showed greatly enlarged tonsils, no adenoid tissue, palpable glands at the angle of the jaws and purulent discharge from the right ear. He was given two complete series of x-ray treatments and at the same time his ear was treated with alcohol and hydrogen peroxid. Clinically, he has been free from colds and attacks of tonsillitis since. The ear has ceased to discharge. The tonsils have decreased markedly in size, and the distance between them has increased to 10 mm. The glands at the angle of the jaws remain palpable. The hemolytic streptococcus was found on two occasions at an interval of one month and was still present five weeks after the last treatment.

This case is interesting, in that it offers a possible way to clear up chronic cases of suppurative otitis media. Evidently roentgenotherapy causes a shrinkage of the infiltrated mucous membrane lining the eustachian tube and middle ear. However, no definite statement should be made on this until pathological sections have been studied.

Acute Catarrhal Otitis Media, One Case.—This case was a college student who had been deaf in his left ear for one month following a very severe cold. Examination showed small tonsils, glands not enlarged, but a large inflamed mass of adenoid tissue compressing the right eustachian orifice and, to a less extent, the left one. He was given one series of four treatments, but at the same time his nasopharynx was treated with silver nitrate. He had a marked reaction with considerable swelling of both sides of the neck and some sore throat after the first treatment. He had no reaction after the second treatment, and a very mild reaction after the third. A roentgen-ray dermatitis developed over the front and sides of the neck about one week after the fourth treatment. Examination at this time showed that there was no reduction in the size of the lymphoid tissue in the nasopharynx. Twenty-seven days after the fourth treatment the patient had a tonsillectomy and adenoidectomy. A pathological section of one of the tonsils showed that apparently the germinal centers were not affected by the x-rays, but that the lymphoid cells between the germinal centers disappeared, and their place was taken by fibroblasts.

BACTERIOLOGY

In addition to observations on the clinical progress of the cases under discussion, it was considered of interest to note such changes as might occur in the bacterial flora of the throats. If it could be shown that retrogression in the size of the tonsils was accompanied by the subsidence of the carrier state in such of the subjects as might harbor pathogenic bacteria in their throats, the advantages resulting to the individual would be obvious.

Doubtless because of the novelty of the irradiation method of treatment, there is very little literature dealing with the changes produced in the bacterial flora.

Murphy and his associates noted the disappearance within four weeks of hemolytic organisms from 30 to 36 carriers. No record is adduced of subsequent study of the individuals. The suggestion is made that proper drainage of the crypts is responsible for the change. Osgood advances the same conclusion. In his paper there is no citation of case reports or bacteriological studies. Nuzum reports that the hemolytic streptococcus disappeared in less than 16 per cent of the cases.

TECHNIC

The material for culture was obtained by means of surface swabs, systematically passed over the desired areas, in the endeavor to obtain a heavy inoculation which would be fairly representative of the actual flora present. For the first cultures, only the tonsils were swabbed. Later, for purposes of comparison, a swab from the pharynx was added. In every case, a separate culture was taken from each tonsil, and careful precautions were observed to prevent contamination of the swabs from surfaces other than those under consideration. The difficulties of the procedure with children of tender age will be appreciated.

For the study of the flora, 3 per cent rabbits' blood meat infusion agar, B.H. 7.8-7, 4, plates were used in every instance. It was found preferable to use media not more than forty-eight hours old. The first plate was rather heavily inoculated with the swab over about one-fifth of its surface. A heavy platinum wire, bent at a right angle, was used to obtain an even spread over the remaining surface of the medium, and was then transferred without flaming to a second plate, which was similarly inoculated over its entire extent. In this way, an even distribution of colonies was obtained over the second plate. Occasionally even the first was suitable for study. The plates were incubated for eighteen hours, and then observed for the presence and relative numbers of colonies of the various bacteria under consideration. Identification of the organisms was accomplished by means of stained films and sub-culture, when necessary, in every instance. It soon became evident that the beta hemolytic streptococcus and the staphylococcus aureus were the organisms of choice for study, both on account of their well-known pathogenic potency and because it was at once apparent that they were the only bacteria of such character to be present as more than transient visitors. Occasionally were found Friedlaender's bacillus, pneumococci, B. coli, and rarely others, but never frequently enough to justify serious consideration in this paper. The influenza bacillus was of somewhat more frequent occurrence, but is not treated of here, in view of its somewhat uncertain potentialities. The ubiquitous non-hemolytic streptococci and chromogenic gram-negative cocci were omnipresent.

DISCUSSION

Certain outstanding features will at once become apparent upon even the most casual perusal of the above tables. Of eight patients who received the full course of eight radiations, five were free from the hemolytic streptococcus and staphylococcus aureus at the time of the final cultures. Of these 5, 3 may be considered as incomplete studies, in as much as a control set of cultures was not taken at the end of at least four weeks following the last treatment. Two patients were therefore free from the bacteria under consideration after the lapse of a considerable interval following treatment. These have not again been observed to determine whether this freedom persists. Three patients continued to yield to hemolytic streptococcus and staphylococcus aureus in large numbers at the end of the stated interval, and this, despite the fact that with two of them there was a certain tendency for the hemolytic streptococcus to disappear during the two courses of treatment. In the other case, the carrier state appeared and persisted in an individual (W.R.) whose flora was at first free from the organisms. The tendency for the or-

ganisms to disappear during the treatment is also illustrated by the incomplete cases, but consideration of the cases W. R. and B. S. will show how fallacious it would be to draw conclusions without the aid of later control cultures.

From the point of view of the individuals concerned, this 40 per cent success, of the permanence of which we have even now no assurance, can scarcely be regarded as dramatic. Six of the 8 individuals harbored the hemolytic streptococcus upon the surface of the tonsils before the institution of irradiation. Of the remaining 2, 1 showed a moderate number of the organisms one month after treatments were ended. This may be regarded as a definitely bad result, viewed from the standpoint of prophylaxis. The other yielded the organism at various times during the course of the treatment, and it is attractive to presume that the tonsillar crypts in this case acted as foci from which the bacteria occasionally made their way to the surface. The observations of Pilot and Davis, who succeeded by the swab method in culturing the hemolytic streptococcus in only 61 per cent of cases from hyperplastic tonsils (which, after enucleation, yielded positive cultures from the crypts in 97 per cent) bear directly upon this point. Of similar import are recent observations of Davis, and of Bloomfield, that serial swabs from the throats of normal individuals will eventually reveal the presence of these organisms. Similarly, we have no proof that, in the two cases from which we were apparently successful in banishing the pernicious elements of the flora, they did not continue to exist in secluded pockets not reached by the ordinary swabbing. It is entirely reasonable that serial quantitative cultures from these children's throats would eventually disclose the undesirable organisms in either or both.

GENERAL CONCLUSIONS

(1) Roentgenotherapy causes a decrease in the size of chronically infected tonsils and adenoids, particularly in the large cellular glands, and less so in the small fibrous glands.

(2) Our experience indicates that roentgenotherapy will not cause the hemolytic streptococcus to disappear permanently from the surface of the crypts of the tonsils, but will cause a small percentage of the palpable glands at the angle of the jaw to disappear. Out of fourteen cases on which we have notes, one case, R. C., showed the palpable glands completely disappeared. In three cases the glands were barely palpable, and in two cases the glands on the left side disappeared and were still palpable on the right side. In the other eight cases the glands were unaffected.

(3) Clinically, roentgenotherapy gives relief from symptoms, but this may only be temporary. In some cases the objective signs of the chronically infected tonsils do not disappear after this treatment: that is, the size of the tonsils is unchanged, hemolytic streptococcus is still present, and the glands of the neck are palpable, although subjectively they are well. In the arthritis case mentioned above, this improvement might be due to the tonic effect of the x-ray.

(4) Generalized use of x-rays for treatment of chronically infected tonsils and adenoids is not advisable.

Practically 100 per cent of chronic carriers of hemolytic streptococcus and diphtheria can be cured by operative removal of tonsils and adenoids. X-ray and radium treatment must be effective in an approximate percentage and at the same time be more comfortable than operation and be associated with fewer complications.

(5) The x-ray treatment of tonsils and adenoids is especially indicated in those cases where a surgical operation is inadvisable, such as chorea, pulmonary tuberculosis, and cardiac and renal lesions. It is our impression that the greatest field of usefulness will be in the treatment of children. Children rarely have a chronic infection of the tonsils comparable to that of adults. Their tonsils and adenoids are very cellular and of the type that responds most readily to roentgenotherapy. Their symptoms are largely due to hypertrophy of the lymphoid tissue in the throat and nasopharynx. It is possible that when the technic is perfected roentgen-ray or radium treatment will entirely supplant surgical measures in children.

DISCUSSION

It is now over a year since the first cases were treated and during that time eight of them have returned for tonsillectomy. One case, G. W., a doctor, who had infection in both tonsils associated with migraine-like attacks, was temporarily relieved by radiation of the tonsils. However, he had a complete return of his symptoms after six months and it was necessary for him subsequently to have his tonsils removed. Very careful pathological studies of the sections of these removed tonsils following radiation are now being made by Dr. Crowe, head of the Department of Otolaryngology of the Johns Hopkins Hospital. Before making any statement as to the effect of radiation on the tonsillar tissue it will be necessary to have a large number of cases and compare them with a large number of normal tonsils. The cells, germinal centers and crypts must be carefully studied individually. The only definite thing we have noted so far has been the constant appearance of hyperemia. I had hoped to be able to make a more definite statement in regard to what actually happens to the tonsils after radiation, but this will have to be after a larger number of cases has been treated.

DISCUSSION

Dr. Virgil Dark, Montgomery, Ala.—We have probably treated in the last year 250 cases of infected tonsils, and in every case the removal had been advised by the family physician for various reasons. Certain types of tonsils respond more readily to radiation than other types, but in almost every case we have seen beneficial effects from the treatment. Two pairs of tonsils may appear the same and one will atrophy immediately and the other require three or four months before very much effect can be observed. We believe in every case where sufficient radiation is delivered to the tonsil some atrophy will result and in the greater number of cases there is a complete disappearance of all the lymphoid tissue. We do not advocate the use of x-ray in all cases of infected tonsils, but in selected cases the results are excellent.

Dr. W. P. Whittington, Asheville, N. C.—I have had in the last year and a half over 100 cases of hypertrophied tonsils for treatment. X-ray treatment is not absolutely specific or a cure for all cases of infected tonsils. No matter what we do with the x-ray we will find cases of cartilaginous or even osteitic degenration that the x-ray will not remove. Of course, these cases are good subjects for the surgeon, but on the other hand I firmly believe that x-ray treatment will almost completely restore many cases of lymphoid and adenoid enlargement of the tonsils to their natural size. We do not take them out literally. We want to reduce the size so there will not be an obstruction to breathing. Tuberculous enlargement of the tonsils should never be operated upon. I have had recently two cases of enlargement of the lymphatic glands with suppuration following tonsillectomy apparently. The x-ray treatment was of considerable value in reducing the size of these lymphatic glands and absorbing the lymphoid tissue in the throat. This treatment is of value because it relieves the patient without loss of time and without the risk to life from a surgical operation.

I have now under observation a little girl of twelve from whose throat one of our best specialists removed the tonsils and adenoids. In a short time the nasal cavity and the upper part of the posterior pharynx were full of adenoid

growths. He removed them a second time and in a few months they appeared again until they protruded almost to the anterior nares and dropped down in the throat to the uvula. He sent her to me for treatment. In four days after the first treatment her mother said she did not have to wake her up in the night to get the mucus out of her throat. The obstruction was so great that the mother was afraid she would strangle. After the second treatment she was able to breathe better and has not missed a day from school since the treatments were started. We have reports from the Rockefeller Institute in New York stating that the x-ray will destroy diphtheria bacilli from the throat of carriers who are doing so much damage in our public schools.

Dr. George E. Adkins, Jackson, Miss.—There appears to be some incompatibility of opinion between the radiologists and laryngologists. You cannot tell by taking swabs from a tonsil whether or not the bacterial flow has been reduced. The very fact that the x-ray lessens the leucocytosis should be a contraindication for treating hypertrophied tonsils with the x-ray. You cannot demonstrate that the x-ray destroys or reduces the bacterial flow if you are judging from the taking of swabs, for it has been proven that swabs are only 40 per cent efficient when well taken.

Dr. Waters (closing).—It is very difficult for me to answer Dr. Adkins' question. I am not a bacteriologist. The question of isolation of these organisms is extremely difficult for one, unless trained in this work. The work was done by Dr. Hitchcock, of the Pathomedical Department of Johns Hopkins Hospital, and that part of the paper was written by Dr. Hitchcock. I cannot go into that at all. The one thing I can say from our standpoint, summing up the whole thing, is that there is a definite clinical improvement in these cases of hypertrophied infected tonsils following x-ray treatment. We are just a little bit inclined to think that it is temporary. What the improvement is due to we cannot say. Whether it is due to a lessening of the virulence of the organism or the tonic effect of the x-ray one cannot say. There is no scientific data published at this time bearing on this point. We are still treating them and they are all getting clinically better. I tried to present the thing from a more or less scientific standpoint. These children were mostly five to ten years old. We did not have trouble with them and we did not have to tie them. By a little moral suasion they would lie peacefully on the table and all were anxious to come back for their next treatment.

There is some danger in the treatment. We had one case of dryness of the throat in a nurse that lasted 24 hours. That is our only case of parotid reaction. The parotid gland must be carefully protected.

Our technic is 3 minutes, 5 milliamperes of current, 25 cm. focal distance, twice a week, and let them rest for three weeks. Our machine, according to the sphere gap reading, is supposed to give 120,000 volts. We all know the bad effects are due to too much radiation.

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
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THE WASHINGTON MEETING

The Association this year will be the guest of the Medical Society of the District of Columbia at the Capital of the Nation.

Washington is one of the most beautiful cities in the world, if not the most beautiful, for it has been made to order. In addition to the scientific treat which awaits those who attend the meeting, there is much in the Capital City to interest and entertain physicians and their families from the South.

SCIENTIFIC WORK

The program will be made up of twenty sections and conjoint meetings covering every phase of medicine and surgery. A goodly number of the preliminary programs of the sections have reached the Association office and they indicate that the meeting will be of the usual high, scientific order as in previous years. Many of the outstanding men in medicine and surgery are represented on the program.

CLINICS

Several of the sections will have clinics in connection with their section work. At the University of Virginia, Charlottesville, the clinical staff of the University Hospital are arranging clinics for Friday afternoon and Saturday morning, November 16 and 17—in connection with the Washington meeting. All physicians attending the Washington meeting are most cordially invited to attend the clinics at Charlottesville. Although no definite information is available, it is practically assured that there will be a clinic program at Baltimore at Johns Hopkins and the University of Maryland, Friday and Saturday following the meeting.

ENTERTAINMENTS

The President of the United States, Hon. Calvin Coolidge, and Mrs. Coolidge, will receive the members of the Southern Medical Association and their wives informally at the White House, Thursday, November 15, at 12:30 p. m. The honor that the President has thus singularly conferred upon the Association by this reception at the White House is much appreciated and will be accepted with pleasure by those who attend the meeting.

The usual reception tendered by the hosts to the President of the Southern Medical Association will be given at the New National Museum on Tuesday night. A section of the Marine Band will furnish the music. This is one of the most beautiful of the many public buildings of Washington.

Of special interest to the ladies will be the reception and tea at the Washington Club Tuesday afternoon, at which Mrs. Woodrow Wilson will be the guest of honor. Space does not permit further comment upon the various entertain-

ments which the Committee is preparing and which Washington affords.

ALUMNI REUNIONS

The alumni reunions are being made a special feature of the meeting and an effort will be made to have all of the principal medical schools represented. Alumni dinners are being arranged through the local committee for these various schools.

GOLF

The Golf Committee announces that there will be "a real golf tournament" and that the championship course of the Columbia Country Club will be used. All physicians who play golf are urged to bring their clubs.

EXHIBITS

In addition to the scientific exhibits which will be brought especially for the meeting, there is being installed in the Arts and Science Building of the National Museum (Old Building) a permanent health exhibit, and a most cordial invitation has been extended by the Director of the Museum to the Association members.

The Army Medical Museum and Library will be open to the visitors. The wealth of this wonderful Museum and Library is at the disposal of those who attend.

HOTELS

Washington has many splendid hotels and, since our meeting comes at what is an off-season in Washington, every one who plans to attend is assured of pleasant and comfortable accommodations. In this issue of the JOURNAL (page 823) is being repeated the hotel information which appeared in the August issue.

RAILROAD RATES

Special reduced round trip rates have been granted by all railroads on the certificate plan. Each member of the Southern Medical Association will receive by October 20 a certificate without making application to the Association office. Physicians who wish to attend the meeting, but are not members of the Southern Medical Association, may receive a certificate entitling them to reduced rates, by advising the Association office of their desire to go. Several special trains and a number of special car parties are being arranged from over the territory for the comfort of those who will attend.

BORDERLINE MENTAL STATES

The frank psychoses are probably on the increase in the United States. At any rate, it seems certain that borderline mental conditions are very much more numerous. From the standpoint of mental hygiene we shall have to direct ourselves toward three problems: the investigation of the cause of these mental states; the education of the Government and the public in preventive measures; and the correction, as far as possible, of the existing mental disturbances.

Why there is an increase in the number of neuro-psychiatric cases is a very hard question, at present, to answer. It has been said that the War, in its various ramifications, increased these states, or at least brought out latent manifestations of them. This may be so, but, on the other hand, modern life presents more freedom of thought and action, more varied interests and more organization, which, theoretically at least, should tend toward a decrease rather than an increase of mental disease.

Our whole public health system needs revision and the most important step, as has often been stated in these columns, would be to put public health as a department of the Government represented by a Cabinet officer, rather than have it as the Public Health Service under the Treasury Department, as it now is. A governmental department would have more power, more money and more resources. Officially appointed boards, properly financed, could investigate mental and other public health problems with greater scope and facilities than is now done.

The state boards of health are largely lacking in interest in the prevention and correction of mental conditions and need much education in this respect. The various foundations and public spirited individuals should also be interested. A long step in this direction has been taken by the National Committee for Mental Hygiene, which is not a governmental institution, but which should receive support and encouragement from every source.

The correction of mental disturbances involves very much larger expenditure of money by Federal, state and philanthropic interests both in social work and institutional care. Some of this human material is defective from the start, some of it lacks lasting properties, some of it becomes contaminated from outside sources, some of it is irregular and misshapen, from some of it by-products may be made useful, some of it can be corrected and made good, but a considerable quantity of it is, of necessity, waste. Even the waste, however, must be properly disposed of and we must not forget that some of this waste may be prevented. So, viewed in this way, the problem is not wholly different from other social and economic problems.

The study of borderline mental states involves not only the study of feeblemindedness but such conditions as pathological liars, those of emotional instability, inadequate personalities, those who react badly to situations, those of criminal mental tendencies, various adolescent states, manic depressive psychoses, paranoid and dementia praecox types, toxic states, drug habitues, endocrin conditions and those states connected with syphilis, pellagra and other disease conditions.

The profession should assume an attitude of desire to know more and a determination to recognize an attempt to classify these mental states in order that they may be investigated, prevented and treated so that the future human race may be elevated to a higher plane and the world become a better place in which to live.

LABELING OF LYE

Countless children are suffering and dying yearly as a result of swallowing caustic alkalis. Esophageal burns with resulting strictures from the ingestion of household lye furnish one of the most pitiable conditions seen by the practitioner of medicine.

Lye plays the role of the chief offender in that it is commonly used in the household and few parents are cognizant of the fact that it is as deadly a poison as those dispensed by the druggist placarded with the warning skull and crossbones. It can be bought from the corner grocery store in an attractive container as are the ordinary food products; and the mother or

servants, not realizing its poisonous qualities, place it in some accessible spot. Straightway the innocent, curious child tastes it and is either permanently invalided or dies. In an effort to aid in overcoming such calamities, the Florida Medical Association, at its May meeting, passed a resolution requesting the State Legislature to make it compulsory for all manufacturers to label caustic alkalis conspicuously, showing their poisonous nature. The Florida Legislature promptly put through a bill modeled after the Pennsylvania Lye Bill, passed by the Pennsylvania Legislature April 11, 1923.

Pennsylvania and Florida are at present the only states having such legislation, but the Lye Commission of the American Medical Association is very active in securing legislation in other states; and it is hoped that Pennsylvania and Florida have been pioneers in a movement that will soon embrace every state of the Union.

With the enactment of these bills the campaign has just begun and every physician as well as the boards of health should aid in educating the public in the dangers of caustic alkalis and about the great necessity of making them inaccessible to innocent children.

SOUTHERN MEDICAL ASSOCIATION SPECIAL TRAINS

Those who had the privilege of Traveling on the Southern Medical Association Special to the San Francisco meeting of the American Medical Association last June will always recall it as one of the most delightful experiences of their lives. The spirit of comradeship and good fellowship which prevails at the meetings of the Southern Medical Association was manifest to a high degree among the physicians, their wives and daughters, who crossed the continent together. The route selected was one of thrills and delight. The wonders of American scenery kept the vacationist enthralled much of the time; but even through the desert areas there was not an uninteresting moment, because brilliant repartee, bridge parties, story telling fests and old Southern songs made the hours happy for the congenial party of Southerners en route to the meeting of their great national association.

The Southern Medical Association Special proved such a delightful method of traveling that it was decided to arrange for several specials from various parts of the South for the trip to Washington.

The Southern Railway System has already announced a special train de luxe leaving New Orleans Saturday, November 10, at 8:10 p. m. and arriving at Washington Monday morning at 7:45. Cars for this train are being made up at Jackson, Meridian, Birmingham, Chattanooga, Memphis, Nashville and other points. The Southern has designated this train "The President's Special" in honor of our President, Dr. W. S. Leathers, who will use it in traveling to the meeting. Those who had the privilege of riding on the President's Special operated by the Missouri Pacific to the Hot Springs meeting will have some idea of the pleasure that is in store for those who will use the Southern's "President's Special" to Washington.

Car parties from other cities to be operated over other lines are being arranged for, and no doubt other special trains will be announced later.

Washington, the Nation's Capital*

When the thousands of physicians from the South with their families journey to Washington for the Seventeenth Annual Meeting of the Southern Medical Association it will be primarily, of course, for scientific and social reasons. But there will be another great object in view for those who have never taken the journey before, namely, to go as the Islamite goes to Mecca, to the, or rather to his, political shrine, the Capital of his Country. The physician who has never visited his Capital, of which in fact he is in reality part owner, will think not only of the benefits and the inspirations to be derived from association with his fellows in the science and in the art of medicine, but also of the opportunity to see at close range the beauties of Washington and as many as possible of the almost infinite number of places of historical, political, literary, scientific and artistic interest in which his Capital City abounds.

FRONT OF THE CAPITOL

Washington and St. Petersburg (now Petrograd) are perhaps the only two great cities of the world which were made to order, as it were. Until George Washington was of middle age the site of the greatest Capital of the greatest country in the world was a partly cultivated amphitheatre surrounded by heavily wooded hills and swamps. Washington sailed by its site as a young man in his boat on his way to Georgetown.

It is said that on these excursions he developed that fascination for the locality which induced him later to lend his great influence in favor of its selection from a hundred miles of territory allowed in the establishing act of the Congress of 1790 which provided for a Federal City somewhere on the Potomac between the Anacostia River and the Conococheague. It is not generally remembered that the location of Washington on the Potomac was the result of a bargain between Thomas Jefferson and Alexander Hamilton to fix the Capital at Philadelphia for ten years from 1790 and forever after on the Potomac where it was desired by the Southern states. In return for this concession by the North the state revolutionary debts were to be assumed by the Federal Government, a measure not favored in the South. The actual spot was selected by Washington, Jefferson and Madison. Washington bargained with the seventeen land owners who held the land between the Anacostia River and Rock Creek and from the Potomac to the range of hills now marked by Florida Avenue.

One of these landowners was a canny Scotchman named David Burns. Burns' cottage, which was only demolished in the memory of many now living, stood on the ground where now the most beautiful of Washington's smaller public buildings has been erected—the Pan-American Union—near the front of Seventeeth Street. It is said that President Washington came all the way up from Mt. Vernon to see Davy Burns especially, as he had obstinately refused at first to relinquish his property on the terms proposed by Washington and his Commissioners. Seated upon a rustic bench near the Scotchman's old cottage, the Father of His Country attempted to convince the irascible Burns of the benefits which would accrue to him by surrendering his lands on the prescribed terms. To all these arguments of the President, Burns turned a deaf ear, saying: "I suppose you think people here are going to take every grist that comes from you as pure grain, but what would you have been if you had not married the Widow Custis?"

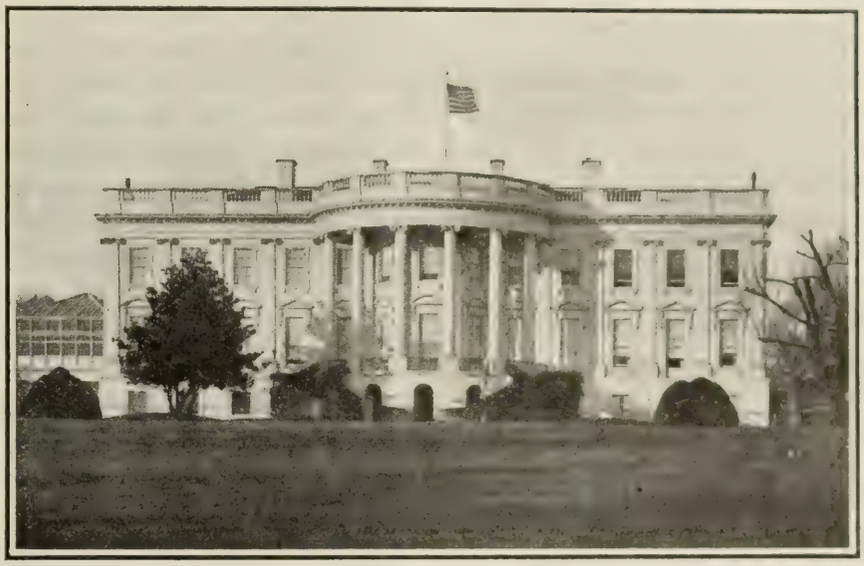
*By W. M. Barton, M.D., Chairman of Sub-Committee on Publicity, of the General Committee on Arrangements, Washington, D. C.

Washington held his temper and tried to impress Burns with the fact that the location of the new City on his land would make him rich.

But David remained obdurate until finally the President is said to have lost his temper and said: "Had not the Federal City been laid out here you would have died a poor tobacco planter." "Aye, Mon," Burns is said to have retorted, "an' had ye nae married the Widow Custis wi a her naggers, ye would 'a been a land surveyor today, and a dom poor one, at that."

Washington arose and started to go; then turning, he said, emphatically: "I have selected your farm, Mr. Burns, as a part of the Federal City and the Government will take it under the right of emninent domain. Now, it will be better for you to enter into an amicable agreement. I will ask you for the last time on what terms you will surrender your land?"

Burns must have noticed the expression on the President's face and saw that he had come to an impasse. He knew what confiscation meant, so he quickly replied: "Your Excellency, I will exchange my lands on any terms you may choose to name."



SOUTH PORTICO OF THE WHITE HOUSE

Washington appointed Major Pierre Charles L'Enfant, a young French engineer who had served in the Revolution, to design the Federal City, and he planned a Capital with every adornment and every convenience then known to human engineering. This plan was based partly upon the French city of Versailles and the ancient city of Babylon with striking focal points, radiating avenues and such dispositions of the public buildings as should and did create a dazzling and beautiful ensemble in which every part has organic relations with the rest. But L'Enfant's plan was of course but a dream and he did not live to see his great inspiration progress farther than a straggling village when he died in 1825.

L'Enfant, like many geniuses, had so many eccentricities of character that he soon involved himself in disputes with the Commissioners, which led to his resignation. With indignation he refused to accept the generous financial offer which Washington kindly and fairly insisted he should take, with the result that for a quarter of a century, old, infirm, attired in a long coat with brass buttons, a bell-crowned hat and knobbed cane, he made his almost daily pilgrimages to the Houses of Congress in a sad and futile attempt to recover his allowance.

He died a pauper and was buried by a kind friend on his farm in Maryland near the city which he had imagined. Very recently after a search his grave was found and the sacred mould transferred to a costly sarcophagus in Arlington, — a monument whose cost would have enabled him to spend his sad and declining years in affluence given to him, alas too late, by a generous but tardy country.

Washington believed firmly that the Potomac River was destined to become a future highway of commerce and the ocean outlet to the middle West, and he backed up his belief by investing in the Potomac Navigation Company. But the entrance of the steam railroad into the economic situation changed entirely the old currents of traffic and sealed the doom of Washington as a commercial city. Washington has become what many persons think it ought to be, the seat of Government now and forever and nothing more.

The first buildings, started soon after the location of the city in 1790, were the Capitol and the White House. The former was begun by Thornton and the latter, originally called the President's House or Palace, by Hoban. Many persons instinctively ask why the President's Mansion is called the White House. True it is white, but so is the Capitol white. This ques-

tion has been answered in different ways, the most plausible being this: Built of Virginia freestone quarried at Aquia Creek, it was originally the color of sandstone. After it was burned by the British, in 1814, at the time of their invasion, the outside was blackened and sooted by the smoke. When it was restored, the walls, which had not been destroyed by the fire, were painted white and it took the name of White House and has been known by that designation ever since.

The cornerstone of the Capitol building was laid at the northeast corner of what was called the North building, the first Senate Chamber, on the 18th of September, 1793, in the eighteenth year of American Independence, in the first year of the second term of the presidency of George Washington by the President himself with Masonic Ceremonies. The cornerstone of the White House was laid in October, 1792.

During the summer of 1800 the Government personnel and effects were moved from Philadelphia to the Federal City, as Washington was then called. There were 123 clerks in all. The President's Palace (White House) was not entirely completed when President John Adams arrived in November, 1800, to spend the last few months of his administration, which was to terminate March 4, 1801. Mrs. Abigail Adams wrote entertainingly and wittily of the lack of accommodations and described how she hung the clothes lines in the since famous East Room to dry the clothes. It was impossible to get wood for the fires although practically surrounded by forest. "And yet," she observed, "it is a beautiful spot, capable of any improvement and the more I view it the more I am delighted with it."

When President Adams delivered his address to Congress when it assembled in December, 1800, he congratulated the people of the country upon the establishment of a permanent seat of government and the members of Congress upon the prospect of a residence no longer to be exchanged at the caprice of fortune. But there must have been some misgivings in his mind and in those of his hearers as to the immediate prospect of comfortable and commodious homes, for of the avenues and streets shown upon the map of L'Enfant not one was visible in reality except a roadway with two or three buildings on it called New Jersey Avenue, just southeast of the Capitol.

Pennsylvania Avenue was a mud hole covered with bushes. A row of six houses loomed up alone in the wilderness west of the White House. The rest was desert, with cabins, barns and desolate fields in which cattle lazily grazed and hogs and chickens ran wild. True, a rather pretentious hotel had sprung up east of the Capitol, but accommodations were so limited that only the Speaker of the House had an apartment to himself. The Southern members with few exceptions found quarters in Georgetown, now a part of the Capital city, and drove back and forth in coaches.

Washington is often called the City of Magnificent Distances; but this phrase was applied to it sarcastically in the early part of the last century because of the great distances between the houses which were scattered over a wide area with bad roads and even woods between. Many shafts of ridicule were hurled at the new City in the same epoch. A witty Frenchwoman referred to Washington as a "City without houses" and at the same time she referred to Georgetown as a "City of houses without streets." Then there was Tom Moore, the famous Irish poet, who visited Washington during Jefferson's first administration and wrote some satirical verses about the new City which have been much quoted. In order to appreciate the lines fully one must know that a man by the name of Pope settled on what became Capitol Hill in the middle of the Seventeenth Century and called his place "Rome." The creek, which passed through the City and flowed along the foot of Capitol Hill, he called the Tiber. The lines most quoted are as follows:

"In fancy now below the twilight gloom
Come let me lead thee o'er this modern Rome
Where tribunes rule, where dusky Davi bow
And what was Goose Creek once is Tiber now.
This famed metropolis where fancy sees
Squares in morasses, obelisks in trees;
Which traveling fools and gazeteers adorn
With shrines unbuilt and heroes yet unborn;
Who naught but wood and Jefferson they see,
Where streets should run and sages ought
to be."

But these witticisms on Washington have long since lost their point. It is now a beautiful capital, one of the most beautiful in the world and universally admired and praised. It is hard for many congressmen, senators, diplomats, cabinet members, office holders and visitors to leave it, once they have resided within its bounds and come under the influence of its magic spell.

Washington grew rapidly during but particularly after the Civil War. The city became transformed. In 1878 a new form of government was inaugurated by which the constitutional provision giving Congress exclusive jurisdiction

over the seat of government acquired an absolute meaning. Taxes were paid into the Federal Treasury and twice the amount so collected might be appropriated by Congress to pay the expenses of civil government on the theory that half the property of the District of Columbia was public property of the Nation. This financial feature of the so-called Organic Act of 1878 has been recently modified so that the Government of the United States pays less than half the cost of running the Government of the District of Columbia. The right to vote, taken away from the citizens of the Capital in 1878, has never been restored. Perhaps the American people would change this if they knew it.

Ab amicis honesta petamus.

It is to be hoped that the thousands of visitors who will come from the sunny South to visit the great Capital of the Nation next month on the occasion of the Seventeenth Annual Meeting of the Southern Medical Association will avail themselves of the opportunity thus offered to see as many as possible of the sights of Washington. What these sights really are will be the subject of another communication.

GOLF AT THE WASHINGTON MEETING

Yes, there will be a real golf tournament during the meeting in Washington! Play will be over the Championship Course of the Columbia Country Club.

We want every golfing member of the Association to bring along his clubs. Let's get together on the links, have a good time and make this the best tournament ever.

There will be the usual prizes and a general get-together for the golfers. Send in or bring with you your handicap and par for your home course. Details of the tournament will be announced later.

H. A. Fowler, *Chairman Golf Com.*,
Stoneleigh Court, Washington, D. C.

CLINICS AND FOOTBALL

Southern Medical Association:

Our clinical staff is arranging for clinics at the University of Virginia Hospital on Friday afternoon and Saturday morning, November 16 and 17, in connection with the meeting of the Southern Medical Association in Washington.

I would also say that this meeting is properly timed for one of the most interesting football games of the season at the University of Virginia. On Saturday, November 17, the University of Virginia plays the Virginia Polytechnic Institute for the first time in over fifteen years. This is one of the big games of the season at home, and I am sure that not only the alumni of the University of Virginia, but other members of the Association who enjoy a game of football will find it worth while to stop over on their way home and take in this game, and the clinics. You may make any use of these facts in your announcements of the meeting.

Very sincerely yours,
Theodore Hough, *Dean*,
University of Virginia.
Charlottesville, Va., Sept. 25, 1923.

HOTEL HEADQUARTERS FOR THE WASHINGTON MEETING

NEW WILLARD HOTEL
- General Hotel Headquarters
- Scientific and Commercial Exhibits
- Section on Medicine
- Southern Gastro-Enterological Association
- Section on Pathology
- Conference on Medical Education

WASHINGTON HOTEL
- Section on Pediatrics
- Section on Obstetrics
- Section on Eye, Ear, Nose and Throat
- Section on Radiology
- Section on Dermatology and Syphilology

RALEIGH HOTEL
- Section on Surgery
- Southern States Association of Railway Surgeons
- Section on Bone and Joint Surgery

SHOREHAM HOTEL
- Section on Urology
- Section on Neurology and Psychiatry

NEW EBBITT HOTEL
- Section on Public Health
- National Malaria Committee
- Conference of Southern States Statisticians

BURLINGTON HOTEL
- Southern Association of Anesthetists

WASHINGTON HOTELS WITH RATES

(Approved by the local Hotel Committee)

New Willard Hotel, 14th St. and Pennsylvania Ave.
Single, without bath, $3; double, $5
Single, with bath, $5, $6, $7; double, $7, $8, $9

Washington Hotel, 15th St. and Pennsylvania Ave.
Single, with bath, $5, $6, $7; double, $8, $10, $12

Raleigh Hotel, 12th St. and Pennsylvania Ave.
Single, without bath, $3, $4; double, $4, $5, $6
Single, with bath, $4, $5, $6, $7; double, $5, $6, $7, $8

Shoreham Hotel, 15th and H Sts.
Single, without bath, $3, $4; double, $6
Single, with bath, $5, $6, $7; double, $7, $8, $10

New Ebbitt Hotel, 14th and F Sts.
Single, without bath, $2.50; double, $4
Single, with bath, $3.50; double, $6

Burlington Hotel, 1120 Vermont Ave.
Single, with bath, $3.50, $4, $4.50; double, $5, $6, $7

Arlington Hotel, 1025 Vermont Ave.
Single, with bath, $5, $6; double, $7, $8

Franklin Square Hotel, 14th and K Sts.
Single, without bath, $2.50; double, $4
Single, with bath, $4; double, $5, $6

Gordon Hotel, 16th and I Sts.
Single, without bath, $3; double, $5
Single, with bath, $5; double, $7

Harrington Hotel, 11th and E Sts.
Single, without bath, $3; double, $4
Single, with bath, $4; double, $5, $6, $7

Hamilton Hotel, 14th and K Sts.
Single, with bath, $5, $6; double, $7, $8

Lafayette Hotel, 16th and I Sts.
Single, with bath, $4, $5; double, $6, $7, $8

Lee Hotel, 15th and L. Sts.
Single, with bath, $4, $5, $6; double, $6, $7, $8

Martinique Hotel, 16th and M Sts.
Single, with bath, $4, $5; double, $7, $8

Powhatan Hotel, 18th St. and Pennsylvania Ave.
Single, without bath, $3, $3.50; double, $5
Single, with bath, $4, $4.50, $5; double, $5.50, $6, $7, $8

Book Reviews

The Operative Treatment of Glaucoma. By H. Herbert, F.R. C.S. (Eng.), Lieut.-Col., Indian Medical Service, Retired; Late Professor of Ophthalmic Medicine and Surgery, Grant Medical College; in Charge of the Cowasjee Jehangir Ophthalmic Hospital, Bombay; Fellow and Syndic of the Bombay University; Consulting Surgeon to the Nottingham and Midland Eye Infirmary; Ophthalmic Surgeon to the Worthing Hospital; Pathologist to the Sussex Eye Hospital. New York: William Wood & Co. Cloth, $3.00 net.

The small book is essentially a supplement to existing textbook descriptions, confined to matters in which the author has taken an active interest. It is largely a resume of papers already published, here worked into a revised and connected whole. But there is no padding. Details are minutely discussed when this appears necessary, while matters fully dealt with elsewhere are omitted entirely. It is hoped that the future of glaucoma treatment may be in some measure foretold here. In any case our increasing knowledge of the subject seems to demand the publication of the material here collected together.

The author's efforts have been confined mainly to following out indications furnished by clinical observations, rather than to working out preconceived ideas. Attempts have been made to repeat with certainty and safety, and perhaps to improve upon, conditions that had developed unexpectedly after cataract and glaucoma operations, sometimes as unwelcome complications.

Nosography in Modern Internal Medicine. By Knud Faber, M.D., Professor of Internal Medicine, University of Copenhagen, with an introductory note by Rufus Cole, M.D., Director of Hospital, Rockefeller Institute. With 21 full-page portraits and 222 pages. New York: Paul B. Hoeber, Inc., 1923. Cloth, $3.75.

This historical treatise is translated by the author. It stresses the importance of classification in the development of medical knowledge. It deals with Sydenham and the nosologists, the Paris school and anatomic diagnosis, German physiological medicine, the bacteriological clinic, functional diagnosis and constitutional pathology. Under pathology, the occurrence of hereditary diseases obeying the Mendelian laws is discussed. "All hereditary diseases must be considered as constitutional anomalies," he says. "Every morbid phenomenon . . . is the result of an injurious morbific factor inconjunction with a susceptibility of the organisms."

In the concluding chapter he says: "The final aim of medicine is to acquire a knowledge concerning etiology and concerning the consequent development of the morbid process. . . . Nosography is one of the means to this end. . . . It has proved a very fruitful method up to this day."

Southern Medical News

MISSISSIPPI VALLEY MEDICAL ASSOCIATION

The Mississippi Valley Medical Association will hold its 48th annual session at Hot Springs National Park, Arkansas, October 9-11, 1923. A notable feature of the program is a Symposia on Cardio-vascular Renal Diseases and Diseases of the Upper Abdomen. Of special interest will be the session at the famous Government Clinic and a tour of the Reservation with its wonderful natural phenomena. Headquarters, Eastman Hotel. Dr. Charles Travis Drennen, Hot Springs, is Chairman of the Committee on Arrangements.

ALABAMA

Dr. H. G. Perry, Vital Statistician for the State Board of Health, recently called a conference in Montgomery to urge physicians and registrars to keep full and accurate reports on births and causes of deaths.

A site of 110 acres near Rosedale, Birmingham, has been purchased for the new Jefferson Tuberculosis Sanitarium. Recently a campaign to raise $200,000 for the project was successful.

The Director of the Birmingham branch laboratory of the State Board of Health announces that a substation for biologic products, where the Pasteur treatment for rabies, tetanus antitoxin, typhoid vaccine and other prophylactic materials may be obtained, will in the near future be established in Birmingham.

Dr. William R. Snow, Manchester, is erecting a private hospital in Winston County at a cost of approximately $20,000. The hospital will have twenty rooms.

Dr. Floyd L. Abernethy has resigned as health officer of Barbour County to accept a position as Field Director with the State Board of Health.

The Russell Hospital, Alexander City, was formerly opened July 17. The hospital was erected at a cost of $100.-000 and has a sixty-five-bed capacity.

Deaths

Dr. Anthony B. Shelby, Huntsville, aged 77, died August 2 following a long illness.

Dr. William Redding Staten, Flint, aged 70, was instantly killed June 5 when struck by a train.

Dr. Joseph Simpson Turney, Hartselles, aged 65, died June 14, following a long illness.

ARKANSAS

The State Hygienic Laboratory, under authority of an act of the Legislature of 1923, will be established in the Capitol Building, Little Rock. Dr. C. W. Garrison, State Health Officer, will be in charge.

Deaths

Dr. T. A. Harvey, Prattsville, aged 84, died suddenly August 1 from heart disease.

DISTRICT OF COLUMBIA

An appropriation of $500,000 to construct and equip an addition to the medical and dental schools of Howard University, Washington, will be asked of Congress at its next session by Secretary of the Interior Work. The proposed appropriation will be used to build a large structure that will almost double the student capacity. Sufficient funds have been secured to provide for additional instructors for the medical school for the next five years. This came about through a $500,000 endowment raised by public subscription and a gift from the General Education Board.

Deaths

Dr. George Nicholas Acker, Washington, aged 70, died July 22 from pneumonia.

FLORIDA

The Florida State Medical Association, at its last annual meeting, passed a resolution requesting the Legislature to make it compulsory for all manufacturers to label conspicuously caustic alkalis to show their poisonous nature and to name antidotes. The Legislature passed the bill modeled after the Pennsylvania Lye Bill.

A school of instruction for city health officers and sanitary inspectors was held by the State Board of Health, in Jacksonville, September 18-22. It was given in order that the methods of sanitary control throughout the State may be uniform.

(Continued on page 36)

SOUTHERN MEDICAL JOURNAL

JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION

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Volume XVI NOVEMBER 1923 Number 11

MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

DIGESTIVE HEMOLYSIS AS A TEST OF LIVER FUNCTION AND THE INFLUENCE OF HEPATIC EXTRACT UPON IT*

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Introductory Remarks.—The trend of modern investigation in the domain of medicine and surgery, in the words of Barton, should be in the direction of the development of practical functional tests of sufficient simplicity to enable every clinician to judge the functional capacity of a certain organ before gross organic lesions or indubitable symptoms have appeared. The philosophical idea that "habits greatly inhibit thinking" is a correct one. Breaking away from the habit of being fed on difficult and complicated methods, accessible only to the few of God's chosen ones, will greatly develop medical thinking and lead toward greater progress. In the last few years a great deal has been accomplished by the explorers of the "human bile fields." Exploring, drilling and draining of the bile wells has become a byword on the lips of every practitioner of medicine who is fortunate enough to see the light of a medical periodical. A new dispute arose between the surgeon and internist as to who is the true guardian of the yellow chamber in the human abode. The problem is still in no man's land and under a violent crossfire from both sides. An undertaking to study liver insufficiency and make deductions therefrom in cases of biliary disturbances appealed to me at this time, and I have therefore selected the simplest and easiest test for liver insufficiency advocated by Widal and his associates, the so-called "digestive hemolysis test."

Physiological Facts Upon Which Test is Based.—Widal, Abrami and Iancovesco (*Press. Med.*, December 11, 1920) proposed the test which consists in studying the hemolytic crisis after the patient has simply drunk a glass of milk. It must be given on an empty stomach. The variation in the number of leucocytes, blood pressure changes, coagulation time of blood and refractometric index of serum is observed for a period of from one to two hours. The execution of the test is very simple and is based upon the following facts:

(1) During ingestion of a meal of albumins, proteins incompletely changed penetrate the gastric and intestinal mucosa and reach the portal circulation. Such unwelcome guests in the circulation provoke a hemolytic crisis.

(2) The liver, if its physiological function is normal, exercises an arresting influence upon those substances and prevents a hemoclasia. They named this function "proteopexic."

Widal's Experimental Hemoclasia on Dogs.—This contention is based upon ex-

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perimental observations. For a better comprehension of the subject, we must bear in mind the disputed opinion of physiologists as to the chemical stage of albumins when they are capable of penetrating the intestinal barrier and enter the portal blood stream. Friedlander, Liniossier, Lemoine, Ascoli, Minet and Leclercq are of the opinion that intact heterogenous albumins not yet effected by the digestive juices can penetrate the intestinal wall. Ellinger, Emden, Knoop, Langenstein and Nolf claim that the same holds true for the albumoses and peptones. Abderhalden and his pupils, on the contrary, conclude that only the finer products of broken up albuminoid substances, the amino acids, can reach the portal blood. The researches of Schmidt-Mulheim demonstrate the fact that when a certain quantity of commercial peptone which is composed of albumoses and peptones is suddenly injected into the circulation of a dog a vasculosanguine crisis takes place, namely, a leucopenia, a drop in the blood pressure and a disturbance in the coagulation. The coarser the substance, the smaller is the quantity required to produce a crisis and vice versa. Widal and his co-workers have reasoned that if the above holds true, then the portal blood of a dog obtained during the course of digestion before it traverses the liver, when injected into the general circulation of the same dog, should provoke a crisis if it carries in its stream imperfectly disintegrated albumins. The blood of the same dog obtained during a fasting period should not give rise to any change. Their experiments along these lines corroborated their reasoning. They demonstrated also to their satisfaction that it takes a small quantity of blood, and only during the first few hours following the meal does the portal blood show hemolytic power. Nolf's theory that during the first period of digestion, that is, during gastric evacuation, the portal blood contains imperfectly disintegrated albumins and peptones proved true, because only during the first two hours after a meal could they obtain a hemolytic crisis. After two hours when the product of intestinal digestion, the amino acids, are found in the portal blood, the hemolytic crisis is negative. They went on to prove the next step and that is the "arresting action of the liver," by demonstrating that when a healthy dog was given a meat meal the products of albumins and peptones were not found in the general circulation, and a leucocytosis was obtained instead of a leucopenia, showing that the liver must have arrested those substances of imperfect disintegration.

Definite Conclusions as to Importance of Test.—Widal and his associates have then conducted numerous experiments upon healthy and sick individuals and no crisis was noted in healthy individuals or even in sick ones where there was reason to believe that the liver was not involved in a pathological process. But in a majority of cases of liver involvement, a positive hemolytic crisis was obtained. They therefore have concluded that it is actually so.

Experimental Demonstration that Protein is the Disturbing Factor in Hemoclasia.—To further prove that the protein in the milk and not the carbohydrate or the fat produces the crisis, they tested individuals who gave a positive reaction with milk by feeding them with 50 gms. of lactose or 30 gms. of melted butter, and a negative result was obtained. When 8 gms. of dry casein corresponding to 200 gms. of milk were given, a very intense and very early reaction was obtained.

Widal's Observations on Various Groups of Patients.—The hemoclastic crisis appeared in all diffuse parenchymatous injuries of the liver, as in catarrhal icterus, cirrhosis, syphilitic hepatitis, passive congestion of the liver (reticulo and endothelial icterus excepted), in the acute affections as pneumonia, typhoid and paratyphoid fever, in appendicitis, severe tuberculosis, nephritis with uremia, in poisoning, especially alcoholism, after chloroform anesthesia and arsphenamin injections, also during pregnancy. Patients with gastro-intestinal disturbances such as amebic dysentery, catarrhal enteritis, entero-colitis with hypochlorhydria and hypermotility, etc., where one would suspect that there is an easy passage of incomplete albumin products across the mucous membrane, the liver being normal in its protecting power, the reaction was negative. According to Widal, when the

crisis is complete all the elements which constitute it follow synchronous developments. Often, however, one may see a dissociated crisis in which the leucopenia is not accompanied by arterial hypotension or by a modification of blood coagulability. Sometimes the crisis, instead of developing into a continuous curve, takes place by steps and one sees an alternate series of decreases, then increases, of the amount of white globules. This is noted in patients to whom a minimum dose of nitrogenous food was given, or in whom the proteopexic insufficiency was on its decline. The most important and most constant element in the test is the leucocyte variation which may be diminished by a half or two-thirds. Very important facts are brought out in the course of study of cases with digestive shock following a meal such as chills, fever, urticarial or herpetic eruptions, dyspneic attacks, etc. The digestive shock is evidently purely sanguine and very probably due to a hemolytic crisis. Another important fact is that it is possible to render a temporary immunity by giving the patient a small quantity of protein shortly before a meal, thereby preventing a hemolytic crisis from taking place. Our unexplainable cases of disturbed digestion are probably due to a diminished proteopexic function of the liver and a digestive hemoclasia producing the toxic symptoms after a meal.

REVIEW OF LITERATURE

Reviewing the literature on the subject, which at present writing comes mostly from German, French and Italian sources, I find that most of the observers are in agreement with Widal and are even enthusiastic over this simple test to determine hepatic insufficiency. A few of the writers are skeptical or disagree with Widal in certain technical or biochemical points. Thus, Julius Bauer (*Deutsch. Med. Wochenschr.*, 47:1519, Berlin, December 15, 1921) found that a leucopenia actually occurred whenever there was a real hepatic insufficiency or when such insufficiency could be assumed to exist. The fall in blood pressure was not a constant symptom. A positive test, i. e., leucopenia with or without a fall in arterial pressure, is a valuable sign in the diagnosis of hepatic insufficiency or of partial function of the liver. A negative result, however, does not exclude hepatic insufficiency. Bauer claims that the crisis can be produced by any product of protein which is foreign to the circulation and not as Widal thinks that only unsplit proteins will produce it. Pick's idea is that there is a chemical or mechanical stimulus generated from the substances stored in the liver and that stimulant expels the peptone-like product into the blood current. Paul Holzer and Erich Schilling (*Berl. Klin. Wochen.*, 58: 1352, November 14, 1921) have tested the reaction in 60 cases with the following results, thus:

(1) In normal individuals there is always a digestive leucocytosis.

(2) In infectious diseases, it is now positive and now negative.

(3) In cardiac livers it is positive.

(4) It is always positive in every manifest liver disease.

(5) Peptone or plasmone (milk casein soluble in hot water) will produce the reaction in liver cases.

(6) It is negative in reticulo endothelial icterus.

(7) The Widal test for protein digestion and the Bauer galactose test for carbohydrate both should be used.

(8) In gastric acidity or subacidity leucopenia often occurs.

They conclude that since in manifest liver diseases subacidity is frequently found, it may be conceived that possibly the Widal reaction may depend upon imperfect splitting of protein in the stomach and intestines. Gautier's (*Rev. Med. de la Suisse Rom.*, 41:727, Geneva, November, 1921) experience with this test has convinced him that it is of value provided that a slight change in the leucocyte count is not regarded as a positive reaction. To establish a positive reaction and the existence of hepatic insufficiency, there should be either a fall in the leucocyte count by one-half to one-third or a parallel and very definite fall in both the blood pressure and leucocyte count. Ernest Somjeu (*Med. Klin.*, 17:1207, Berl., October 6, 1921) examined 82 cases of different diseases without knowing the clinical diagnoses of the cases. The test was al-

ways made with the patient in bed. He used milk, cane sugar, butter and water. His conclusions are as follows:

(1) No medicine should be given immediately before or after the examination, as it might affect the reaction.

(2) We should be alert to notice often a rapid appearance and disappearance of the reaction. If we do not bear this in mind, a positive reaction may be overlooked.

(3) No definite judgment can yet be passed as to the clinical significance of the reaction. Its relation to the liver seems to be specific.

Pierre Mauriac (*J. de Med. de Bordeaux*, 94:83, February 10, 1922) remarks: "The custom of adopting this reaction as practically the only test required to demonstrate hepatic insufficiency is rather loose and not well founded." In order to warrant the conclusion of certain authorities that digestive leucopenia is frequently noticed in asthma, there should be a sufficient number of observations. K. Dresel and F. H. Lewy (*Ztschr. f. d. ges. exper. Med.*, 26:87, Berlin, January 20, 1922) observed the same results with 50 gms. of cane sugar in cases of paralysis agitans. The diminution is marked in the lymphocytes, while the behavior in neutrophiles varies. Usually they are reduced in number, but in some cases they compensate the decline in lymphocytes. It occurs clinically in all cases where the disease is of recent origin or where it is still progressive. The influence of hepatic opotherapy on hemoclastic crisis was studied by Jean Oddo and P. Borie (*Presse Med.*, 29:988, Paris, December 14, 1921). In a case of biliary cirrhosis it was shown that the hemoclastic crisis disappeared entirely after six days of opotherapy (2 gms. of powdered liver per day). The treatment was interrupted for 15 days and the crisis reappeared. It disappeared again after 7 days of treatment. The treatment did not influence the nitrogen metabolism. Seven cases of various diseases of the liver are now reported which gave similar results. Powdered liver seems to have a specific action on the hemoclastic crisis. This confirms Widal's conception that this phenomenon is due to a proteopexic insufficiency of the liver. The view of the authors is that opotherapy has an elective action upon certain functions of the liver only, for in none of the cases was the reappearance of a digestive leucocytosis accompanied by other signs of a return to normal of the functions of the liver such as polyuria, increase of weight and disappearance of cholemia. They reason that it is probably possible to prevent the accident of a hemoclastic crisis in cases of chloroform anesthesia and following arsphenamin administration if the patients are prepared by opotherapy a few days before and after the treatment. A very interesting observation along these lines is reported by Hans Mantuer and Gerty Cari (*Klin. Wochenschr.*, 1:523, Berlin, March 11, 1922). They found that children with normal livers react to milk as well as to water with leucocytosis, but children with liver disease react with leucopenia to the giving of either milk or water. Their contention is that the shock-like clinical picture in anaphylaxis from peptone intoxication is due to spasm of the liver veins. I. W. Wolf (*Schweiz. Med. Wochenschr.* Basel, 52:764, August 3, 1922) tried the test on 95 cases and comes to the following conclusions:

(1) This test for liver insufficiency is dependable where other methods have failed.

(2) The variation in leucocyte formula is the essential element and speaks for a disturbance of liver cells.

(3) It affects particularly the neutrophiles. The behavior of the lymphocytes is not uniform; a pronounced eosinophilia can be expected with certainty in severe cases of anaphylactic shock.

(4) The method makes it possible in cases of urticaria, asthma and Quincke's edema to discover the elementary etiology and give rational treatment by gradual desensitization.

(5) The amino acids alone are responsible for the crisis, due to a disturbed capacity for synthesis in the liver cells.

Miklos Roth (*Orvosi hetil.*, Budapest, 66:313, August 6, 1922) has tested the Widal-Abrami reaction on 22 cases and concludes that there is no doubt of the specificity of the test with reference to

liver function. The diagnostic and prognostic conclusions of the writers are exaggerated. The test is of value in differential diagnosis between cirrhosis of the liver and tuberculous peritonitis; and between cholelithiasis and nephrolithiasis. But even when the test is negative, liver injuries cannot be excluded.

Remo Monteleone (*Policlinico, Prac.* Sec., Rome, 29:1101, August 21, 1922) has investigated the test in 18 patients, testing for alimentary glycosuria and urobilinuria. His conclusions are that while alimentary glycosuria was always negative, urobilinuria could be demonstrated in all the cases that were positive for the hemoclastic reaction. This fact greatly lessens the value of this last for the study of the hepatic function.

PERSONAL VIEWS WITH TABLE OF OBSERVATIONS ON 40 CASES

This brief review of the literature furnishes material for thought and consideration. The surgeon as well as the internist should ask the question, "Is this new protein test an asset or a liability?" It is rather strange to observe so much enthusiasm and interest in foreign camps and very little, if any, displayed in the English literature.

The interest in gall bladder infections and its new treatment can possibly be studied from a new standpoint. We all agree that the most common causative factor in biliary disturbance is bacterial invasion. How does it gain entrance? Shall we admit that it makes its way through the tail end of the biliary system against a constant current, or does it select an easier road on a main stream, traveling with the current? Good and sound judgment will argue in favor of the latter route. It must then reach the liver station first. If so, should not we start a clean-up campaign from the main structure down to its outlets instead of reversing the order? Liver function tests, then, should be made in every case of biliary infection before we attempt any form of treatment, but unfortunately those tests are as numerous and as difficult of execution to perfection as the laws of Moses. Widal and Bauer are offering us new and simple tests to determine the protein and carbohydrate efficiency of the liver. If their value can be proven, we should accept it and adopt it as a routine in our daily clinical work, because of its simplicity and reliability. I am presenting here a table of 40 cases which I have studied in the last several months with the results as tabulated. For lack of time, I paid attention only to leucocyte count, arterial pressure and blood coagulability, leaving out for the present refractometric index of the serum. For the same reason no attention was given to the bilirubin index nor any comparison made to determine any relationship between them. The test was made as described by others, namely: observations were first made upon an empty stomach or after a six-hour fast, and then a glass of milk was given; 20 minutes later the second observation was made; the third and fourth followed at 20 minute intervals, and the fifth one hour after the fourth. The results of my observations are plainly discerned from the table which follows:

TABLE OF OBSERVATIONS ON DIGESTIVE HEMOCLASIA OF WIDAL AS A TEST OF LIVER FUNCTION

GROUP I—Normal Individuals

Case No.	Leucocyte Formula	Arterial Pressure	Blood Coagulability	Vasculo-Sanguine Crisis
1	7500	122- 80	3 min.	—
	6950	120- 80	3 min.	
	7600	122- 80	3 min.	
	7800	124- 82	3 min.	
	8250	124- 80	3 min.	
2	6200	134- 78	3.5 min.	—
	6900	134- 78	3.5 min.	
	7200	136- 80	3 min.	
	7800	134- 78	3.5 min.	
	10000	134- 80	3.5 min.	
3	9000	118- 68	2.5 min.	—
	8600	116- 70	3 min.	
	9260	120- 72	3.5 min.	
	10000	120- 72	3.5 min	
4	6200	132- 84	3 min.	—
	6200	132- 84	3 min.	
	6000	132- 84	3 min.	
	7200	132- 84	3 min.	
	8650	132- 84	3 min.	
5	7500	118- 76	not obs.	—
	6250	118- 76		
	7000	118- 76		
	6250	not obs.		
	8250	not obs.		

GROUP II—Chronic Cholecystitis

6	12250	168- 98	2.5 min.	++
	5250	154- 88	2.5 min.	
	9000	158- 90	3 min.	
	6000	not obs.	2 min.	
	6250	not obs.	2 min.	
7	5750	134- 64	not obs.	+?
	4750	134- 64		
	6000	134- 64		
	6750	134- 64		
	5750	134- 64		
8	7500	110- 62	not obs.	+
	6500	100- 58		Dissociated
	4500	not obs.		
	4750	98- 54		
	5500	104- 62		
9	6250	124- 80	not obs.	—
	6750	124- 80		
	7750	124- 80		
	6250	124- 80		
	6000	124- 80		
10	10250	168-104	3 min.	++
	5500	168-104	2.5 min.	Interrupted
	9250	168-104	2.5 min.	
	11000	168-104	3 min.	
	6750	168-104	3 min.	
11	7500	not obs.	not obs.	—
	7750			
	7750			
	7250			
	7500			
12	6000	not obs.	2 min.	+
	5750		2 min.	
	4500		1.5 min.	
	6250		2.5 min.	
	6000		2.5 min.	
13	9500	120- 80	3 min.	+
	7000	126- 80	2 min.	Dissociated
	7500	118- 80	1.5 min.	
	9500	118- 80	2.5 min.	
	6000	118- 80	2.5 min.	
14	9000	not obs.	3.5 min.	+?
	10500		2 min.	Dissociated
	7500		1.5 min.	
	9750		2.5 min.	
	13000		2.5 min.	
15	7500	not obs.	not obs.	—
	8000			
	8500			
16	6250	150-120	3 min.	+?
	6500	148-120	3 min.	
	7000	152-120	3 min.	
	4500	138-120	2.5 min.	
	5000	148-120	2.5 min.	
17	5250	100- 60	3 min.	—
	5500	100- 60	3.5 min.	
	6000	100- 60	3.5 min.	
	6000	100- 60	3.5 min.	
	6000	100- 60	3.5 min.	
18	7000	110- 80	2.5 min.	—
	7000	110- 80	3 min.	
	7250	104- 80	3 min.	
	5500	112- 80	2.5 min.	
	6000	106- 80	2.5 min.	
19	7250	180- 70	3.5 min.	+?
	12500	162- 62	2.5 min.	
	5000	162- 62	2.5 min.	
	6500	150- 60	2 min.	
	8500	160- 62	1.5 min.	
20	5750	96- 46	2 min.	—
	6000	110- 50	1.5 min.	
	9000	110- 60	2 min.	
	6000	100- 58	2 min.	

GROUP III—Chronic Cholecystitis
(Effect of Hepatic Extract)

21	(Before Hepatic Extract injections)			
	6750	104- 68	not obs.	+
	5250	98- 62		
	4300	100- 68		
	4300	100- 60		
	(After 9 injections of Hepatic Extract)			
	8000	not obs.	not obs.	—
	8750			
	7500			
	6500			
	8750			
22	(Before Hepatic Extract injections)			
	5250	184- 84	not obs.	+
	7500	134- 80		
	3550	134- 80		
	4000	136- 82		
	(After 7 injections of Hepatic Extract)			
	8550	142- 86	not obs.	—
	8500	142- 84		
	9600	144- 84		
	9970	142- 82		
	10200	142- 82		
23	(Before Hepatic Extract injections)			
	9250	132- 78	not obs.	+
	4500	126- 70		
	9250	not obs.		
	10000	not obs.		
	9250	not obs.		
	(After 7 injections of Hepatic Extract)			
	6250	134- 82	not obs.	—
	10500	134- 82		
	9500	134- 82		
	7750	134- 82		
	7250	134- 82		
24	(Before Hepatic Extract injections)			
	8250	not obs.	not obs.	+
	6500			
	5000			
	6500			
	7000			
	(After 6 injections of Hepatic Extract)			
	4250	100- 58	2 min.	—
	4750	100- 60	2 min	
	6500	110- 60	3 min.	
	6000	110- 60	3 min.	
	6500	108- 60	3 min.	
25	(Before Hepatic Extract injections)			
	8000	100- 60	2.5 min.	+
	11500	98- 60	2.5 min.	
	4500	98- 60	1.5 min.	
	7500	98- 60	2 min.	
	7500	98- 60	2 min.	
	(After 5 injections of Hepatic Extract)			
	8750	160- 60	3 min.	+
	7250	160- 70	2.5 min.	
	5500	190- 85	2 min.	
	5750	180- 80	2 min.	
	5500	180- 80	2 min.	
26	(Before Hepatic Extract injections)			
	8000	110- 60	3 min.	+
	7500	100- 45	3 min.	
	4000	86- 45	1 min.	
	6000	86- 45	1 min.	
	6250	114- 86	2 min.	
	(After 7 injections of Hepatic Extract)			
	5750	110- 60	3 min.	—
	8750	98- 60	3 min.	
	7750	106- 58	3 min.	
	6000	96- 54	3 min.	
	5500	96- 54	1.5 min.	

GROUP IV—Intestinal Autointoxication

27	4750	124- 70	not obs.	+
	6250	108- 60		Dissociated
	7250	not obs.		
	6000	not obs.		
	4500	108- 74		
28	4500	110- 70	2.5 min.	—
	3500	110- 70	2.5 min.	—
	3250	110- 60	2 min.	
	3000	114- 70	2 min.	
	4500	110- 60	2.5 min.	

29	6250	112- 78	3 min.	+
	4500	112- 78	2.5 min.	
	3750	106- 70	2.5 min.	
	3000	108- 74	2.5 min.	
	3500	108- 74	2.5 min.	
	GROUP V—Gastric Neurosis			
30	6250	140- 82	not obs.	—
	8250	not obs.		
	5500	not obs.		
	5250	130- 76		
	7000	not obs.		
31	6750	110- 50	2 min.	—
	9750	110- 50	2 min.	
	10250	100- 40	3 min.	
	7500	100- 40	3 min.	
	7500	110- 50	3 min.	
32	6000	not obs.	3 min.	—
	7000	120- 68	3 min.	
	9250	122- 70	3 min.	
	7250	118- 68	3 min.	
	7000	120- 72	3 min.	
33	7550	100- 60	3 min.	+?
	9250	100- 60	3 min.	
	6750	90- 50	2 min.	
	7750	90- 60	1.5 min.	
	7000	100- 60	3 min.	
	GROUP VI—Diabetes Mellitus			
34	6750	126- 84	3 min.	—
	7000	126- 84	3 min.	
	7250	126- 84	2.5 min.	
	7500	126- 84	3 min.	
	7500	126- 84	3 min.	
35	12500	184-110	2 min.	+
	8000	174-104	2 min.	
	5250	170- 88	2 min.	
	10000	168- 94	3 min.	
	10500	190-110	3 min	
36	6000	100- 60	2.5 min.	—
	5000	100- 60	2.5 min.	
	7250	100- 50	3 min.	
	5750	100- 60	3 min	
	6000	100- 60	2.5 min.	
	GROUP VII—Miscellaneous			
	Gastric Carcinoma (Pyloric without obstruction)			
37	13500	not obs.	3 min.	+
	12000		3 min.	
	7750		2 min.	
	12000		2.5 min	
	13000		2.5 min.	
	Cardiac Liver			
38	7000	170-120	3 min	—
	7250	170-120	3 min.	
	9000	180-120	3 min.	
	6000	170-110	3 min.	
	7750	170-110	3 min.	
	Asthma (during an attack)			
39	10250	140- 80	2.5 min.	+
	10250	122- 70	2.5 min.	
	13500	140- 90	3 min.	
	9750	136- 80	1.5 min.	
	8500	140- 80	1.5 min.	
	Banti's Disease (with marked Ascites)			
40	2000	100- 32	not obs.	++
	500	92- 32		
	750	85- 32		
	1500	88- 32		
	1750	96- 32		

In analyzing the above table of observations on 40 cases, we notice that all normal individuals have either an appreciable or slight increase in the leucocyte count and no change in arterial pressure or blood coagulability. The 20 cases of cholecystitis show either a straight hemolytic crisis, dissociated one, or interrupted. Several of them show very slight variation or constant, but we must bear in mind that the tests upon those cases were made after a course of treatment. I did not have the opportunity of studying them before the treatment was begun. Part of the treatment of the above cases consisted of duodenal biliary drainage. Here I wish to call to your attention the fact that in cases of cholecystitis where the Widal test shows a diminished proteopexic function of the liver, we should not depend upon duodenal biliary drainage alone, because it is only a link in the chain of relief. We must try to stop the entrance of bacteria into the general circulation from whatever source. We must improve the function of the liver by a proper diet, exercise, alkalis, plenty of water, autogenous vaccines if one has faith in them, hepatic extract for its influence upon modifying the proteopexic function of the liver and a prolonged course of duodenal biliary drainage. True, it is a very tedious treatment, but in a large number of cases our results will often be equally good, if not better than the application of surgery alone without any attention to the liver function. If we attack the problem very early when symptoms of indigestion set in, making use of the Widal test for diagnostic purposes, we shall probably avoid surgical interference in many cases.

Notice Case 11, in which there was a history of 15 years' standing of abdominal cramps, loose bowels and toxic biliary symptoms. Duodenal biliary drainage gave no relief and a cholecystectomy was advised. Appendectomy had previously been done. A badly diseased gall bladder was removed and the patient's condition had not improved. Other possible factors were eliminated by careful study. The constant leucocyte count in this case is probably due to the fact that the test was made after a six-hour fast and he was still immunized by previous food, or not enough protein was given. At any rate, the constancy of the leucocyte formula in this case cannot be accepted as a normal liver function. It will require further study and observation.

Influence of Hepatic Extract upon the Hemoclasia Test.—A year ago, before this

Association, I advocated the use of hepatic extract (soluble), as a useful agent in our gall bladder and liver cases. Since then, I understand a number of observations were made and from many quarters quite satisfactory results were reported. For my own satisfaction I wished to try out the effect of that liver substance to correct a deficient proteopexic function of the liver. In all the six cases reported in this table, you can readily notice that there is a decided change in the leucocyte formula. This seems to corroborate the findings of Jean Oddo concerning the influence of hepatic opotherapy upon the hemoclastic crisis. I still maintain that 1 c. c. of the hepatic extract is not a sufficient dose. How the hepatic extract influences the proteopexic function of the liver I cannot explain; but the fact remains that changes in the leucocyte formula are observed after the use of hepatic extract, as observed in the table.

Groups IV and V should be of special interest to us as gastro-enterologists. We often see cases presenting symptoms of intestinal toxemia, being unable to determine at the same time where the toxic focus lies. Cases 27 and 28 are interesting examples. They show a marked deviation justifying a suspicion that their symptoms are of liver origin. In these cases all other avenues of infection have been carefully eliminated. They are not relieved of the fetor oris and coated tongue by any form of treatment. Cases of that type are quite common and quite troublesome. Whether their symptoms are of liver origin because they show a positive Widal is a matter for further investigation. Case 29 shows a marked hemoclasia with a definite history of pelvic infection. The group of gastric neuroses has practically a normal curve. The negative Widal in those cases is an additional proof that their symptoms are of neurotic origin. The diabetics, after treatment, show practically a normal curve. In Group VII, the gastric carcinoma case shows a leucopenia only once forty minutes after a protein meal. The proteopexic function in this case is evidently not affected. The cardiac liver case gives a negative Widal. The case of asthma is interesting, showing a slight drop in the leucocyte count and a change in the coagulation. The most interesting case in this group is that of Banti's disease, the last in the group. The liver in that case unquestionably was involved in the process of fibrosis, as there was a marked ascites and tapping was necessary every third or fourth day for a period of six weeks before the child died. Notice the sudden drop of leucocyte count from 2000 to 500. An interesting feature in this case was the effect of hepatic extract upon the color of the stool. Every time hepatic opotherapy was used the color of the stool would change from grey to yellow and when hepatic extract was discontinued the grey color would reappear, demonstrating thereby that the hepatic extract had a decided action on the remaining liver cells capable of producing bile. It will probably be of interest to mention here a very important point with regard to protein immunity.

A case which was cholecystectomized years ago and which continued to complain of epigrastic pain, developed eight months ago urticaria and hay fever. It took on a chronic and stubborn character, and was especially intense during the menstrual period. Bearing in mind Widal's protein immunity, as applied to his hemoclasia test, I suggested half an ounce of panopepton 20 to 30 minutes before each meal. If the urticaria and hay fever is the expression of a protein-sanguine crisis, the panopepton before meals should render immunity. To my surprise, the urticaria and hay fever quickly disappeared and for three weeks the patient was perfectly comfortable. I discontinued its use for two weeks, and during that time her menstrual period appeared, and even during that time she was practically free from the urticarial annoyance. This case is under further observation.

CONCLUSIONS

In concluding this article, we must admit that the digestive hemolysis test of Widal offers something interesting which might prove of practical value. It is too soon to draw definite conclusions; but the evidences are certainly in favor of Widal's contention. It might pave the way for a better understanding of the pathology of the biliary tract. From the study of the 40 cases reported by me and a number of cases studied by others, it is permissible temporarily to come to the following conclusions:

(1) Liver pathology can probably be detected early by the test of digestive hemoclasia of Widal.

(2) In our study of gall bladder infections, we should bear in mind that the pathology often begins from the liver end of it and if so, direct our attention to that organ first.

(3) The so-called intestinal toxemias and simple cases of indigestion are probably of hemoclastic origin.

(4) Hepatic opotherapy undoubtedly influences the Widal hemoclasia test.

(5) A large percentage of cholecystitis and cholelithiasis cases give a positive hemoclasia of Widal and the results of our treatment, whether medical or surgical, should probably be checked up by the Widal liver test.

(6) Diseases arising from protein hypersensitiveness should be studied by this test.

(7) The test is not conclusive, but it invites enough interest for further observation and study.

(8) It should be adopted as a routine laboratory test.

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DISCUSSION

Dr. George M. Niles, Atlanta, Ga.—Papers which evince energy and perseverance are welcome in our Association. I wish to commend Dr. Levin for his industry in producing a paper of such thought and depth.

Dr. Julius Friedenwald, Baltimore, Md.—I have had no experience with Dr. Levin's special test, but I have used another test for determining liver function which Dr. Gantt and I have carefully investigated, the phenoltetrachlorphthalein test of Rountree published some years ago, which could not be utilized for practical purposes until Dr. Aaron, of Buffalo, was able to secure a stable preparation of the phenoltetrachlorphthalein. This test presents a most valuable means of determining liver function. The dye is given by hypodermic injection and the bile is collected by means of a duodenal tube. In normal individuals the daily rate of excretion is extremely constant, the average being according to our experience in 13.7 minutes. A delay of more than twenty-three minutes in the excretion of the dye indicates the presence of some hepatic disease or mechanical obstruction at some point between the biliary ducts and the ampulla of Vater. The most marked delay occurred in biliary cirrhosis.

Dr. D. N. Silverman, New Orleans, La.—There is no doubt that the Widal hemoclastic test for liver function has its place.

Dr. Friedenwald spoke of the phenoltetrachlorphthalein test for liver function. I have checked up in a few cases the results of this test as modified by Aaron with the Widal hemoclastic test and have found usually a leukopenia present when there was a prolongation of the time of elimination of the phenoltetrachlorphthalein by intravenous administration, recovering it from the duodenum through a duodenal tube. In other cases, where we suspected liver tumor, and in one case of abdominal tumor in the right upper quadrant of the abdomen, the dye was eliminated in eighteen minutes, which comes within the normal time mentioned by Dr. Friedenwald. The Widal hemoclastic test was negative.

In another case, where the elimination of tetrachlor was prolonged forty-five minutes, there was distinct hemoclasis.

In the study of liver function we must not forget that the liver is only one organ in the digestive chain. When we administer protein we cannot say in all cases with the same liver disturbances that we have the same digestive factors to deal with. In our studies of pancreatic digestion we have found in 35 instances of biliary disease that the pancreatic digestion varied in cases which "apparently" had the same trouble. In two cases of carcinoma of the liver and gall-bladder, with obstruction of the common duct, there was in one the absence of pancreatic enzymes and achylia; in another hyperacidity and good pancreatic digestion. This was evident from an examination of the stool before we examined the enzymes.

I would like to ask Dr. Levin whether these digestive factors would interfere with the amount of undigested protein that is absorbed from the small intestine. Might this necessitate the liver's taking care of a variable quantity?

Dr. R. B. McBrayer, Sanatorium, N. C.—I should like to ask Dr. Levin why he suggested using alkalies. Alkalies are not the things that will help the proteins to be split before they go through the gut wall.

I wish he had put a little more emphasis on the coagulation time, and not so much on blood pressure. When we interpret the coagulation times reported ourselves, I am afraid we have to split hairs. When you say most of the coagulation time is three minutes now and in twenty minutes it is two and a half minutes, I do not know whether we ought to swear by it or not.

When we begin to work on this we must consider it as we would, for instance, basal metabolism. If we are going to make this test, we have to be able to interpret it.

It is probably because of things going wrong in the liver that we are getting in the years to come a chronic nephritis. Certainly as men who are practicing medicine we have to live up to the statement that apoplexy is a preventable disease.

Dr. J. F. Yarbrough, Columbia, Ala.—During the past ten years we have had in the hospital many cases of this type. A number of them had been treated in the best hospitals in the North and East. Many of them brought case histories from the hospitals in which they had been treated. In not a single instance did the record show that the liver had been suspected of playing an important role in the condition treated, although there were hard white stools, indigestion, colitis and other evidences of inadequate hepatic function.

Dr. Charles G. Lucas, Louisville, Ky.—I should like to ask Dr. Levin whether he has had any experience with hepatic extract given per orem.

Dr. Edgar D. Shanks, Atlanta, Ga.—I want to ask Dr. Levin to give us a little more information about the technic of the test. I have done a great many blood counts in my professional life, and while we all try to do them as carefully as we can, certain errors are liable to creep in on account of the pipettes we use in making them.

I believe you will get some of the variations observed in this chart from a consideration of the pipettes that are put out by the commercial houses. Were the pipettes used standardized?

Dr. Levin (closing).—I thank Dr. Niles for his kind words.

Dr. Friedenwald spoke of the dye test. As I said in the introduction of my paper, I am standing on a platform to simplify medicine, because, after all, the majority of medical men here come from remote country places and from small towns, where they have no facilities for carrying out the difficult laboratory methods that some of us are advocating. If we make a test so simple that the average practitioner can carry it out, medicine will be greatly benefited.

The test described by Dr. Friedenwald is of value, and I am glad Dr. Silverman brought out an important point in comparing these tests. You do not have to go to the trouble of taking blood pressure and the coagulation time, as I stated in my paper. The leukocyte count alone is of great value, and any doctor who has a microscope can make a leukycyte count. The dye test requires technic. You have to introduce a tube, obtain the bile, inject the dye, and then make a calculation. The average doctor is afraid of mathematical calculations. The Widal test does not require calculations of percentages. It is a simple test.

There is no doubt that great benefit will be derived from a comparison of these tests. We must all admit that a good many cases of pancreatic disturbances are first of liver origin and the pancreas is involved secondarily.

As to the amount of protein that can be given to influence pancreatic disturbance, I have not made any observation or studies. This is the beginning of my work, but I will do so in the future, and I shall encourage Dr. Silverman, who probably has the facilities at Tulane, to further this work and tell us something about it.

I advocate the use of alkalies in the treatment of cholecystitis and biliary infection to liquefy the bile. Duodenal biliary drainage alone does not cure those cases; some belong to the surgeon. We have to eliminate the bacterial foci of infection. The elimination of cholesterin, fried food and acids from the diet is essential. We must endeavor to influence a free flow of bile. Alkalis produce a freer flow of bile from the biliary system. Plenty of water is an excellent medium for biliary drainage. Regulation of bowels and exercise are also important factors. I advocate the use of hepatic extract, which stimulates the liver to drain the bile, relieving thereby tension or stasis.

Dr. McBrayer asked why I laid stress on the coagulation time and blood pressure. I do not feel that I laid too much stress on those things. On the contrary, I lay more stress on the leukocyte count alone. You who have not the facilities or the time for many tests certainly have time to make the leukocyte count alone, and that will be of great value. It does not take long to make a leukocyte count.

As to the change in blood pressure, that in itself is a study. Why do we have a change in blood pressure? That should be worked out with skill and careful observation.

I have been as careful as possible in doing this work. I have spent nights with a competent technician, and every blood count was checked twice to see whether there were any errors. Where an error was discovered, another test was made, and the one before was discarded.

Dr. McBrayer laid stress on chronic nephritis, which I have not mentioned in this group. Widal and others state plainly that in their observations in chronic nephritis there is a positive Widal. There is undoubtedly a relationship between liver toxins and chronic nephritis. Why have we a high blood pressure in nephritis and at the same time, as a rule, a disturbance of liver function? We should pay particular attention to this phase of the subject.

I want to thank Dr. Yarbrough for discussing my paper so freely. As far as bile salts are concerned, I am afraid he is a little too enthusiastic. I have adopted the subcutaneous method of giving bile salts, for the simple reason that we are not so sure when we give bile salts by mouth what happens to them in the stomach. What effect has the gastric juice to change the bile salts we give

by mouth? It seems to me it is a better way to give them hypodermatically, as it is not likely that we will have any change in the substance when given subcutaneously. We should also expect quicker results than by the oral administration.

As to the hepatic extracts in one mil. (sterile) ampoules, the dose is from 7 to 9 grains. I maintain that it is not sufficient, because French observers give liver substance in much larger doses.

In answer to Dr. Shanks, so far as the technic is concerned, I have been very careful regarding it. I have provided myself with a dozen pipettes of a standard make, and every case had the same pipette, not changing it to see if there was an error in the pipette. The pipette is standardized, and therefore the manufacturer is responsible, and not I.

A Member.—How often do you give these bile salts hypodermically?

Dr. Levin.—One injection a day and continued for seven and nine days, and then I make observations. Sometimes I give an injection twice a day, but this will have to be studied by making personal observations. We do not know how much to give and how long to keep it up, because in cases of Banti's disease, jaundice from various causes and acute hepatitis hepatic extract has caused the stool to change invariably from a gray color to a yellow color in twenty-four or thirty-six hours. The minute you discontinue the hepatic extract the gray color reappears. One case of acute jaundice treated by me with hepatic extract, given twice a day, cleared up without any biliary drainage in forty-eight hours.

BACILLUS ACIDOPHILUS: RESULTS OF FEEDING MILK CULTURE*

By Geo. C. Mizell, M.D.,
Atlanta, Ga.

The studies here recorded were suggested by the very fascinating address of Dr. C. C. Bass delivered before the members of the American Congress on Internal Medicine, sixth annual clinical session, Rochester, Minn., April 5, 1922, and the instructive work of Rettger and Cheplin set forth in their monograph on "Transformation of the Intestinal Flora," published by the Yale University Press.

Bass stated that his own researches along this line have consisted chiefly of an attempt to confirm the observation of previous investigators as to the possibility of transforming the intestinal flora and to develop a practical method of accomplishing it. His conclusions were in conformity with those of Rettger and Cheplen.

He concludes that

"We are now able to transform the intestinal flora from the usual mixed type to a simple one, consisting chiefly of Bacillus acidophilus, a natural inhabitant of the intestinal canal, especially in young, healthy persons, at the same time greatly reducing proteolytic bacteria, or eliminating them entirely."

Furthermore, he remarks:

"By transforming the flora it should be possible to determine whether the many symptoms, diseases and conditions, including premature senescence, commonly believed to be due to intestinal intoxication, are really due to it, and if any are proved to be caused in this way, a promising remedy will be at hand."

With these promising conclusions in mind we began a study of the effect of feeding acidophilus milk in two groups of patients. In one were patients in whom the laboratory findings showed chronic intestinal toxemia of the putrefactive type and symptoms which we believed to be due to toxemia. In the other, those suffering from chronic intestinal stasis and colitis, but no putrefactive toxemia. The object was to determine the influence of this treatment upon the symptoms and urinary products of intestinal putrefaction. We began by using the microscopic picture of the stools as an index to the degree of toxemia. We had not progressed very far before our observations suggested to us that the results were not in accord with the transformation of intestinal flora, such as the findings observed by the above investigators.

Recently Bassler and Lutz (Bacillus Acidophilus: Its Limited Value in Intestinal Disorders, *J. A. M. A.*, August, 1922, p. 607) questioned the correctness of the conclusions that the flora is so transformed, and suggested that the change was more apparent than actual. In this connection it is instructive to study closely the paper of Gompertz and Vorhaus (Observations on Acidophilus Bacillus, *Annals of Clinical Medicine*, July, 1922). They state that on the fifth or sixth day after feeding Bacillus acidophilus milk culture, these organisms represent 90 per cent of the fecal micro-organisms and that the Bacillus coli decreases to less than 10 per cent.

*Read before Southern Gastro-Enterological Association, meeting conjointly with the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Also Kopeloff and Cheny (Studies on the Therapeutic Effect of Bacillus Acidophilus Milk and Lactose, *J. A. M. A.*, August, 1922, p. 609) found that the intestinal flora becomes changed on treatment with Bacillus acidophilus whole milk and lactose, but the relative percentage of gram-positive rods rarely exceeds 70 per cent. Our laboratory findings are in accord with the above.

Notwithstanding the apparent great reduction in the gram-positive organisms, it was observed that in some cases indican in marked degree persisted in the urine and the symptoms were unabated. Our enthusiasm was somewhat cooled by these results. We considered the enormous number of acidophilus bacilli that were being introduced daily into the alimentary tract and the possible great increase in this number in transit and wondered if these facts brought about the change in the microscopic picture by dilution rather than by actual decrease in the proteolytic organisms.

The average number of micro-organisms excreted daily has been estimated at about one hundred and thirty billion. According to Kopeloff and Cheny (*J. A. M. A.*, August, 1922, p. 610) the daily dose of 1000 c. c. of culture contains in the neighborhood of one to two hundred billion acidophilus bacilli. As it appears conclusive that the organism multiplies in the intestine this multiplication would not have to increase very rapidly to produce a large enough number greatly to overshadow the gram-positive organisms.

This analysis led us to believe that microscopic examination of the stools did not give us a true index of the degree of toxemia. Furthermore, persistence of symptoms and indicanuria in some, and relief in others, with the same change in the microscopic picture, could not be harmonized. So it was necessary to adopt another plan by which the degree of toxemia could be judged.

Our clinical experience has proved to us that we may depend upon the urinary findings as an index to the putrefactive type of toxemia and that the symptoms of toxemia parallel the urinary findings.

For the purpose of this study we selected a group of 10 patients who were, by laboratory tests and symptoms, suffering from intestinal toxemia, putrefactive type, and another group of 10 suffering from a chronic colitis and stasis, but no putrefactive toxemia. The symptoms of each group were carefully studied before and during the period of Bacillus acidophilus milk feeding in an effort to determine what group of symptoms were due to (1) toxemia and stasis and (2) to stasis alone. It should be stated that all of the patients of the second group, in addition to stasis, had some degree of colitis which we had reason to believe was due to the stasis or remedies previously employed to relieve it.

The conclusion that certain symptoms were due to excessive intestinal putrefactive toxemia was arrived at by feeding a lacto-farinaceous diet, given below, for one or two weeks, at the end of which time the stools would be non-putrefactive in character; the urine, clear of indican; the patient, free from certain symptoms.

DIET

Gruels made of arrowroot, barley, rice, oats, crackers, flour or corn meal, cream of wheat.

Crackers, toast, butter.

Butter milk, sugar of milk.

Malted food made with water and sweet milk, equal parts.

Egg yolks, scrambled with sweet milk.

Creamed potatoes, baked potatoes.

Pot cheese.

Macaroni, spaghetti, noodles, cooked in slightly salted water.

Puddings made by boiling 10 ounces of milk, slightly sweetened, sprinkling in three tablespoonsful of cooked rice or rice flour, tapioca, sargo, arrowroot or corn starch; add the yolks of two eggs and cook in oven 20 to 25 minutes.

Custards made of egg yolks, milk, sugar, etc., and flavored with vanilla, cocoa.

(Meals given every three hours.)

After this demonstration the patient was given a general diet of about 2500 calories per day. He was instructed to eat a small portion of meat, two eggs, a quart of milk, vegetables, cooked fruits, breads and cereals each day. Examination of urine was then made at three-day intervals and when indican was again present in the urine in marked degree, with return of symptoms, these symptoms were noted. This procedure also serves the purpose of excluding those having in-

dicanuria from some extra-intestinal source.

The symptoms relieved by a lacto-farinaceous diet and recurring on a general diet were designated as being due to putrefactive toxemia. The milk in the diet was then replaced by 1000 c. c. of acidophilus whole milk. This milk was prepared from culture by instructions obtained through the kindness of Dr. C. C. Bass. Examination of urine and notations as to progress were made at three- and four-day intervals. In the second group the progress was judged by the symptoms and mucus present in the stools.

We are aware that this method of study is open to criticism in that the change of food may have some influence on the symptoms aside from those involved in the production of putrefaction. However, as there is no better method available, we have taken (1) symptoms which are commonly attributed to intestinal toxemia and (2) indicanuria as an index to the degree of intestinal toxemia.

The chief symptoms of each group may be tabulated as follows:

It will be noted that certain symptoms are more marked in one group than in the other, and that some present in the first group are rare or absent in the second. This difference in symptoms we attribute to the putrefactive toxemia in the first group.

In regard to soreness in the first group, it should be stated that this is probably due to slight chronic colitis which was also present in patients Numbers 1, 2, 3, and 6. This symptom does not appear to be consistently present as a result of stasis and toxemia, without colitis.

In general it may be stated that both groups of patients were chronic intestinal invalids and had been more or less in this state for years. Their state of health was perhaps worse than is suggested by the list of symptoms given above. In addition to those shown, each had one or more individual symptoms. Seventy-five per cent, or 15, of them had had various sorts of surgery, all the way from thyroidectomy to hysterectomy. Thirty-five per cent, or 7, had demonstrable post-operative adhesions. Patient 11 had a troublesome chronic appendicitis, mild hyper-

TABLE I.—CHIEF SYMPTOMS OF

Toxemia and Stasis in Patients of Group 1.	Stasis and Colitis in Patients of Group 2.
Headache, marked in 100 per cent.	Not marked.
Aching limbs, marked in 90 per cent.	Rare.
Despondency, marked in 100 per cent.	Absent.
Abdominal pain, 60 per cent.	Marked in 70 per cent.
Abdominal soreness, marked in 40 per cent.	Marked in 100 per cent.
Gas, actual, 20 per cent.	Marked in 100 per cent.
Gas, complained of, 80 per cent.	Not often.
Vomiting and nausea, 20 per cent.	Absent.

TABLE II.—THERAPEUTIC EFFECT OF BACILLUS ACIDOPHILUS MILK CULTURE IN CHRONIC INTESTINAL TOXEMIA (PUTREFACTIVE TYPE) AND STASIS, GROUP 1.

Patient	Condition Before Treatment	Indicanuria	Duration of Treatm't	Results of Treatment Stasis	Symptoms	Indicanuria
1. Colitis	Stasis, ileo-cecal, moderate	+++	3 months	Relieved	Relieved	—
2. Colitis	Stasis, colon, moderate	+++	2 months	Relieved	Relieved	—
3. Colitis	Stasis, ileo-cecal, marked	+++	5 months	Relieved	Relieved	—
4. Colitis	Stasis, colon, moderate	+++	2 months	Relieved	Relieved	—
5.	Stasis, cecal, marked	+++	3 months	Relieved	Relieved	+++
6. Colitis	Stasis, rectal, marked	+++	4 months	Relieved	Unrelieved	+++
7.	Stasis, cecal, marked	+++	4 months	Unrelieved	Unrelieved	+++
8.	Stasis, colon, moderate	+++	3 months	Unrelieved	Unrelieved	+++
9.	Stasis, ileo-cecal, marked	+++	2 months	Unrelieved	Unrelieved	+++
10.	Stasis, colon, marked	+++	5 months	Unrelieved	Unrelieved	+++

SUMMARY

Relieved of stasis, symptoms, and indicanuria	40%
Relieved of stasis and symptoms, but not of indicanuria	10%
Relieved of stasis, but not of symptoms and indicanuria	10%
Unrelieved of stasis, symptoms or indicanuria	40%

TABLE III.—THERAPEUTIC EFFECT OF BACILLUS ACIDOPHILUS MILK IN CULTURE IN CHRONIC COLITIS AND CHRONIC INTESTINAL STASIS, GROUP 2

Patient	Condition Before Treatment	Duration of Treatment	Results	
			Stasis	Symptoms
11.	Chronic appendicitis. Stasis, colon, moderate	2 months	Relieved	Relieved
12.	Stasis, ileo-cecal, marked	6 months	Relieved	Relieved
13.	Stasis, ileo-cecal, marked	3 months	Relieved	Relieved
14.	Stasis, colon, moderate	3 months	Relieved	Relieved
15.	Stasis, colon, slight	2 months	Relieved	Relieved
16.	Stasis, colon, marked	5 weeks	Relieved	Relieved
17.	Stasis, colon, moderate	2 months	Relieved	Improved
18.	Stasis, cecal, marked	2 months	Unchanged	Improved
19.	Stasis, rectal, marked	2 months	Unchanged	Unimproved
20.	Stasis, colon, marked	2 weeks*	Unchanged	Unimproved

*Milk omitted, as it was thought it aggravated an eczema.

SUMMARY

Relieved of both stasis and symptoms	60%
Relieved of stasis and symptoms improved	10%
Not relieved of stasis, but symptoms improved	10%
Unchanged as to stasis and symptoms	20%

thyroidism, and an extensive inactive pulmonary tuberculosis. On milk culture she gained 15 pounds and from an invalid was enabled to resume normal activities.

Also most of them had other pathology, especially of the stomach, such as achylia, chronic gastritis, or gastrectasis. We feel that the test of the remedy was a severe one, but that the observations were none the less instructive even though we were in most instances dealing with a secondary condition.

In all of those who were relieved of the so-called toxic symptoms and stasis (Group 1) and of colitis and stasis (Group 2) general improvement in the way of gain in weight, in quality of blood, and strength was observed.

We have attempted to discover some reason for the failure of the treatment in each case where no improvement could be noted and find a possible reason as follows:

Group I.—Patient 6 had a chronic metritis which may have interfered with results, and although she cleared up twice on the test diet, this may have been a coincidence. While on a general diet with milk culture, meats omitted, and bicarbonate of soda given, a dram, before meals, she was relieved of symptoms, stasis, and indicanuria. This result appears to have been secured by the laxative effect of bicarbonate of soda.

Patient 7.—No reason could be found. She has been under observation 10 years and is never clear of symptoms except while on a lacto-farinaceous diet.

Patient 8.—Probably had a cholecystitis.

Patient 9.—More than one of my colleagues know this patient. She has gone the rounds during the past 10 years. Nothing had been accomplished in our hands. She was bed-ridden. Her height was 5 feet 6 inches, weight 83½ pounds. The diagnosis was ileo-cecal stasis from post-operative adhesions and intestinal toxemia. She made very little progress in the two months that she was on the milk culture, together with the general diet. The symptoms, constipation and indicanuria, were unchanged. Enemas had to be used to evacuate the bowels. After this period the following changes were made: meats were omitted; petroleum oil, one ounce, was given at bedtime. In a few days the bowels were acting daily, symptoms and indicanuria cleared and in the next three months she gained 38 pounds. She is now normal in her activities and has such confidence in the milk culture that she refuses to give it up to see if it is really needed to maintain her improved state of health.

Patient 10.—Had a six-hour gastric residue of two or three ounces, but this was also present in two others who recovered.

Group II.—Patients 18 and 19 had post-operative adhesions, but these were also present in five others who secured relief. However, the first was relieved by adding mild alkaline laxatives to the treatment. Patient 20 had a six-hour residue, also a severe eczema, which appeared to be greatly aggravated by treatment; hence, it was discontinued.

We have made no observation to determine the duration of relief given. According to Bassler it lasts only during the period of milk culture feeding. Bassler does not state how long his patients were on treatment. Perhaps a long period would give some permanent improvement.

However this may be, we feel that the results are highly satisfactory.

The work of Rettger and Cheplin has opened up a large field for investigation and we expect some form of this treatment to find a valuable place in intestinal therapy.

Finally, subject to the limitations of this small clinical study the following conclusions appear permissible:

(1) Relief from chronic intestinal toxemia, putrefactive type, and stasis, even in the presence of intestinal adhesions, has been secured while feeding Bacillus acidophilus milk culture in conjunction with a general diet.

(2) Chronic ileo-colon and colon stasis of undetermined origin as well as secondary to intestinal adhesions may be relieved by feeding Bacillus acidophilus milk.

(3) When results are not so secured additional measures of a non-irritating character directed to the relief of the constipation and some modification of diet may render the treatment effectual.

DISCUSSION

Dr. Charles G. Lucas, Louisville, Ky.—In Dr. Mizell's 20 cases there were 15 surgical misfits. If there is anything for the internist that is difficult to treat, it is those patients who have been through the hands of the surgeon for whom little or nothing can be done. The 40 per cent good results in the first 10 cases and 60 per cent in the second speak well for Dr. Mizell's treatment. When we consider that the longest period during which this treatment was kept up was only six months, and the pathologic processes that gave rise to surgery and the changes that took place in the abdomen dated back many years, the results have been good. The question is, how long will the improvement last? That can be determined only by experience in the future. At the same time, Dr. Mizell has every reason to be satisfied with his results so far.

Dr. Sidney K. Simon, New Orleans, La.—I was on the clinical side of some of Dr. Bass' laboratory work. I referred about ten cases in all to Dr. Bass for the purpose of trying out from my point of view the clinical effect of feeding acidophilus milk. Dr. Bass was interested in the bacteriologic side. The results, as I tabulated them from approximately ten cases, were disappointing clinically. These ten cases were all chronic intestinal invalids. They belonged to the group of ileo-colon stasis, some of them presenting very marked constipation, and others the mucous colitis type of intestinal stasis. There was one case particularly that I studied carefully after the administration of the Bacillus acidophilus milk. She was a long sufferer from chronic mucous colitis and examination of her lower bowel through the proctoscope showed an intense degree of inflammatory condition. It had that brown, brawny hue that we usually find in chronic types of colitis. Dr. Bass reported to me upon an examination of the stools before the administration of the milk that she had almost a pure culture of streptococcus. We kept her under observation about six weeks and she had a large amount of this milk. She drank a quart of the milk each day, and I believe at one period two quarts of the milk. The effect clinically was not very striking. She continued to suffer with abdominal pains. Proctoscopic examination at the end of treatment did not show any very marked reduction in the intense congestion that appeared originally. I was rather disappointed in the clinical results, although Dr. Bass informed me she had responded bacteriologically very well in the transformation of her intestinal flora.

One thing I did learn with a great deal of emphasis from these observations was how foolishly we have been administering so-called tablets and cultures therapeutically in cases of intestinal toxemia with the idea of transforming intestinal flora. Dr. Bass has brought that point out in his recent communication. The transformation of the intestinal flora, although it is a very great desideratum, one that we should strive for because intestinal toxemia is a large subject in clinical medicine, we find is difficult. It is not the simple matter that pharmaceutical houses would have us believe, to administer small amounts of stock cultures or tablets with any hope of a real transformation of the intestinal bacteria.

Dr. C. C. Bass, New Orleans, La.—The clinical report of Dr. Mizell is very interesting. As Dr. Simon has already told you, I have been interested largely in the experimental and laboratory side of this subject, and not especially in the therapeutic application. Although, some time ago, my enthusiasm may have led me to hope that we were about ready to begin to make some therapeutic application of Bacillus acidophilus, I have later come to feel that there is a great deal of experimental work to be done before we are prepared to make any extensive therapeutic tests. It sounds very well to say we shall administer so much acidophilus milk, get transformation of the intestinal flora and then observe the clinical results. But as we have studied the life and method of reproduction and the influences that control the reproduction of the organisms, we are learning that there are a great many influences which must be controlled if we are to get the maximum transformation of the intestinal flora.

One of the greatest disappointments to me has been to learn that there is no hope at present of complete transformation of the intestinal flora while patients are on a general diet; that it is necessary to regulate the diet to a considerable extent, at least, as well as to administer our milk cultures. It is true, a certain considerable amount of predominance of B. acidophilus can be obtained while disregarding the diet, but if we expect to get complete transformation of the intestinal flora or anything approaching it, the diet and no doubt other influences must be controlled.

One of the great difficulties is the slow multiplication rate of B. acidophilus as compared with a number of other bacteria. For instance, let us take the colon bacillus. One colon bacillus makes two in about seventeen minutes, two make four and four make eight in like periods, etc. Within a period of twenty-four hours we have an enormous number of organisms from one colon bacillus. The acidophilus bacillus, on the other hand, takes one and a half to two hours to make two bacilli. The multiplication rate is much slower than that of the colon bacillus. You can readily see we must introduce a great preponderance of acidophilus bacilli over the colon bacilli that are already present if we obtain a preponderance of B. acidophilus.

Another thing that is not generally known and has not been appreciated at all by any of the other investigators in this field so far as I know is that in a culture of B. acidophilus in milk the number of bacteria increase or is doubled every one and a half to two hours until the peak is reached, but whenever that peak is reached, instead of there being a plateau, the number drops as rapidly as it rose. If we employ cultures that have been allowed to go beyond this peak and to drop, we administer sour milk with very few living acidophilus bacilli in it. This points out one of the difficulties we are up against and one of the reasons it is absolutely necessary that a great deal more research should be done before we may expect any extensive practical application of acidophilus therapy.

With regard to the permanency of the B. acidophilus flora, it disappears soon after feeding is discontinued. We need not hope to be able to maintain the acidophilus flora after it is produced unless we continue to maintain the necessary conditions. However, present information seems to justify the hope that we may learn just what age, kind and quantity of culture to feed with each meal to maintain the flora indefinitely as long as the feeding is continued. If the culture can be made to be a very pleasant food beverage, which the milk culture is, the treatment would not be difficult to carry out, provided an adequate supply of the acidophilus milk culture can be obtained. If it is found to have therapeutic value and is desirable, I see no reason why those who supply milk commercially might not deliver acidophilus milk instead of bulgaricus milk or any other according to order.

Up to the present time I have intentionally avoided discussing any apparent therapeutic results. We are in great danger, when trying new remedies, of becoming over-enthusiastic and misinterpreting what we see.

I do not agree with the criticism made by Bassler in a recent article in the *Journal of the American Medical Association*, which no doubt many of you have seen. He questioned whether there was any colonization of the B. acidophilus in the intestinal canal as a result of feeding the cultures. Anyone who wishes to determine the facts and has any bacteriological ability at all, can demonstrate to his own satisfaction the practical exclusion of gas-forming proteolytic bacteria from the feces that results from feeding suitable cultures.

I wish to call attention to the fact that the microscopic examination of the stools and examination of the gram-stained specimen is an absolutely unreliable and untrustworthy method of determining whether the desired transformation of the intestinal flora has been accomplished or not. Bacillus acidophilus, when grown under certain conditions that may exist in the colon, frequently becomes gram-negative. In fact, in the experimental laboratory we have been able to change a pure culture of B. acidophilus from gram-positive to gram-negative and vice versa. What occurs in the test tube may also occur in the intestinal canal. Therefore, the proportion of B. acidophilus in feces cannot be determined by examination of gram-stained preparations. Cultural methods, although time-consuming, are necessary.

Dr. Seale Harris, Birmingham, Ala.—I want to call attention to an article that was published in the *Journal of the American Medical Association* about January 15, of this year, by McGarrison, an Englishman, in which he reports his experiments and observations in some of the English possessions near the Himalayas. McGarrison fed monkeys on autoclaved rice and other sterilized foods; then made autopsies on them and found after a certain length of time that nearly all of these monkeys developed inflammatory lesions. Ileo-colitis was the most important one. McGarrison proved a thing that Ravenal pointed out with the tubercle bacillus, that bacteria will penetrate the intestinal walls and be found in the mesenteric glands and in the blood stream. The sections McGarrison made showed the organisms going directly from the intestines into the blood stream, and he also found that so long as these monkeys and other laboratory animals were fed on a properly balanced diet, those lesions did not take place. In other words, the streptococcus, staphylococcus and other organisms did not amount to anything in the intestinal tract so long as the monkeys were properly nourished. It is, therefore, evident that focal infection from the intestine is a matter of great importance. I think the question of intestinal bacteria has a lot to do with Jackson's membrane and Lane's kink by penetrating directly through the intestinal wall and causing a low grade localized peritonitis in the colon.

In the treatment of cases with Bacillus acidophilus, it is important that the patient should have a well balanced diet, and particularly that there should not be an excess of proteins. When the patient gets two quarts of milk a day, he gets about the amount of protein he should have. We should also have consideration for the vitamins. Milk contains most of the vitamins, but the vitamins contained in vegetables and fruits are also necessary. The diet should be well balanced.

I would like to ask Dr. Bass if he has made any observations in connection with his studies with a high protein diet or a low protein diet?

I think a patient might have a very high carbohydrate diet for a few days, but it is not wise to continue the high carbohydrate diet too long, any more than it is wise to continue the high protein diet too long.

Dr. John L. Jelks, Memphis, Tenn.—There is in some of these cases a marked indicanuria, marked cecal stasis, adhesions producing intestinal stasis, and in other cases there is streptococcic inflammation of the intestine from focal infections above, also parasitic infections. Let us see if we cannot be fair with the experimenting man by getting rid, for instance, of the focal infection above, the teeth and tonsils, from which we are getting the streptococcic infections and the peri-intestinal organized transudates or peri-intestinal veils and the peri-colic membranes. We should get rid of the focal infection first, and then we have an opportunity for the Bacillus acidophilus milk to accomplish all that can be brought about. If you have a large cecal cesspool and do not attend to that surgically, get rid of the causative relationship there, you are doing a little injustice to the Bacillus acidophilus and his labors.

Dr. Mizell (closing).—I stated in the paper that this class of patients is a very severe test of any treatment. The usual case of intestinal toxemia that is present as a primary condition is not difficult to handle through diet. But the patients used for our observations are those that have been proved to be of a more difficult group. They have had this condition for such a long time that necessarily changes must have taken place in the bowel itself and perhaps in the liver, such changes as will allow the passage of unusual amounts of toxic materials to be absorbed from the bowel and handed on to a liver that has been more or less crippled by the long-standing intoxication. We have all of these conditions to consider. Dr. Jelks' point in regard to the removal of focal infections is very well taken. We have attempted to do this in every case, that is, not only to relieve focal infections, but to relieve the mechanical condition affecting the bowels that can be relieved by surgery. After we have done this, we often have a patient who exhibits a toxemia and leads a miserable existence on account of what we call intestinal toxemia. Those are the patients that give me the most trouble, and they are not very few in number.

I am glad Dr. Bass mentioned the effects of acidophilus milk upon gases in the bowel. Another patient, not included in this group, suffered from an acute colitis associated with marked distention of the abdomen. She had a diarrhea, or I thought it was a diarrhea, in that she was having eight or ten fluid movements a day. I gave her half a gallon of acidophilus milk in each twenty-four hours and the diarrhea continued. I then gave her a dram of bismuth, three times a day, or two drams, to relieve the diarrhea. She was on that treatment for a week, at the end of which time gaseous distention had subsided, and on physical examination I felt something unusual in the abdomen. I did not know what it was and sent her for a plate, which showed a beautiful picture of the colon, perfectly outlined, entirely filled with residue and bismuth. It was filled from the head of the cecum around to the rectum. There was not one bubble of gas in the large bowel. I did not know what was the trouble with the patient. It took two weeks' time to clear this mixture out of the bowel by giving daily enemas. After the stools had turned to a light color from the brown or black color produced by the bismuth, I made a proctoscopic examination, as I was reasonably sure I had an obstruction to deal with that had not been determined by digital exploration. We could not find an obstruction, and the patient has had no further trouble since that time. When we got the bowels cleared out with the enemas and emptied, the diarrhea ceased and the patient made a rapid recovery.

If we are to have permanent results from treatment in these patients, we must keep it up for a long time, until we get a change in the organic conditions that may be present, such as the causes of ileo-colon stasis, cecal stasis, and rectal stasis.

SECTIONAL FEEDING*

By A. J. Waring, M.D.,
Savannah, Ga.

PART I—A DISCUSSION OF DIETETIC METHODS

The past ten years have witnessed a decided increase throughout the Southern states not only of pediatrists, but also of medical men, not specialists, who think and study intelligently the problems of infancy and childhood. It is an open question whether this development is fully appreciated in the North and West. We are still sadly handicapped in Southern communities by lack of medical centers, high-grade hospitals, and a wealthy and ambitious laity. The time will undoubtedly come when many of the problems in the Southern field of pediatrics will be studied by Southern men and valuable donations made to our knowledge of juvenile diseases. At present many such investigations are competently, but of necessity, superficially made, by flying medical squadrons financed in Northern institutions.

Somewhat ahead of the growth of this deeper and more scientific side of our sub-

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*Read in Section on Pediatrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

DIET CHART

Name ..... Age .....Weight .....Date.....

Correct Weight.....

MEAL—A	Amt.	Cal.
Food.....		
MEAL—B		
MEAL—C		

EGGS AND DAIRY PRODUCTS
(Chiefly fats—vitamins—proteins—salts)

Butter
Buttermilk
Cow's milk (boiled-unboiled)
Cow's milk (skimmed-unskimmed)
Clabber
Curd
Cottage cheese
Cream cheese
Egg (coddled)
Egg yolk (hard boiled)
Egg (poached)
Egg (soft boiled)
Egg, scrambled (with brains)
Junket
Lactic acid milk

STARCHES AND STARCHY VEGETABLES
(Chiefly carbohydrates)

Artichoke
Beans
Beets
Bread (white)
Bread (corn)
Bread (Graham)
Bread (whole wheat)
Barley
Corn flakes
Crackers, unsweetened (toasted)
Cornmeal mush
Corn pudding
Carrots
Farina
Hominy
Macaroni
Oatmeal
Potato (white)
Potato sweet)
Peas
Rice
Turnips
Toast (milk)
Wheat (Cream of)
Wheat (Shredded)
Wheatena
Zwiebach

GREEN VEGETABLES
(Chiefly salts—vitamins—bulk)

Asparagus
Beets (top)
Brussels sprouts
Collards
Celery (raw or stewed)
Cabbage
Cold Slaw
Cauliflower
Egg plant
Lettuce
Mustard greens
Okra
Onions
Rhubarb
Spinach
Swiss chard
Squash
Tomatoes
Turnips (top)

SOUPS
(Chiefly fats and starches)

Beef (starch-vegetable)
Chicken (starch-vegetable)
Lamb (starch-vegetable)
Asparagus (Cream of)
Celery (Cream of)
Corn (Cream of)
Peas (Cream of)
Tomato (Cream of)
Oyster

FISH AND MEATS
(Chiefly vitamins—salts—proteins)

Blue fish (boiled-broiled)
Beef juice
Beef steak
Beef (roast)
Bacon
Beef (scraped)
Brains
Crab
Chicken (roast)
Fish roe
Halibut (boiled-broiled)
Lamb chops
Mackerel, fresh (boiled-broiled)
Oysters
Sweet breads
Shrimp
Trout (boiled-broiled)
Whiting (boiled-broiled)

FRUITS AND NUTS
(Chiefly carbohydrates—fats—vitamins)

Apples (raw-cooked)
Almonds
Bananas (baked)
Berries (stewed)
Chestnuts (boiled)
Figs (fresh-dried)
Grapes
Grapefruit
Lemons
Limes
Oranges
Prunes (stewed)
Peaches
Pears
Pineapple
Peanuts
Peanut butter
Pecans
Walnuts
Watermelon

DESSERTS
(Chiefly carbohydrates)

Custard (baked)
Custard (boiled)
Corn starch pudding
Ice cream (plain)
Jello
Lady fingers (dry)
Rice pudding
Sherbet
Sponge cake (dry)
Tapioca

ACCESSORIES

Cocoa
Cane sugar
Jams
Maple syrup
Mayonnaise
Preserves
Cane syrup
Honey
Jellies
Maple sugar
Olive oil
Sugar cane

MEAL—D	Amt.	Cal.
Food.....		
MEAL—E		
MEAL—F		

A balanced diet must contain not only sufficient proteins, carbohydrates, fats, mineral salts, and water, but also certain substances called vitamins. The day's dietary should, therefore, always contain cow's milk, or its derivatives; leafy vegetables and citrus fruits in addition to other foods. It must also be remembered that when obtainable, flours from whole grain or the whole grains themselves are more life-supporting than the devitalized, white or manufactured flours; the latter having no vitamin content. According to the above principles, the child's diet will always be guided, no matter what pediatrist you may consult. Modifications in diet for a child of a given age will depend upon—

1. Presence of disease
2. State of digestion
3. State of nutrition
4. Accessibility of foodstuffs
5. Season of the year
6. Temperature
7. Latitude
8. Altitude

A. J. WARING, M.D., Savannah, Ga.

ject has been the crystallization of ideas among Southern men in regard to the diet and nutrition of Southern children. The writer has met a few Southern pediatrists who believe they can feed Southern children in a Southern climate somewhat more competently than pediatrists from other sections.

In this connection the writer wishes to emphasize sharply a few points. A great deal of our work among mothers is educational. Witness the crusade for breast-feeding. Many diet charts throughout the United States consist of lists of foods arranged by the physician sometimes intermingled with cooking directions. The writer has examined many such lists from all over the United States in the past three months. Such a list furnishes the mother a spelling lesson without appealing to her intelligence. Who has not seen the mother in a nervous frenzy because Dr. A—— of the West says to begin the yolk of egg at six months, Dr. B—— of the South says never to begin egg until the baby is two years old, and Dr. C——of the North says that Dr. A—— and Dr. B—— are both wrong! As a matter of fact, the mother should be taught to think about classes of foodstuffs rather than about articles of food. Many mothers have had courses in domestic science and in general know something about fats, carbohydrates and proteins. Why not add a word about mineral salts and water and vitamins, and give the mother the frame work of a balanced diet on which she can string her beads by the exercise of a limited judgment? The epochal work of MacCallum was not intended for a selfish medical absorption. The writer has seen enlightening methods employed in a few clinics and by a few pediatrists, but not often. There are two or three generally useful rules:

(1) Do not pit the pediatrists of different sections against one another in unfortunate and often only apparent rivalry. For example, "Dr. Brown says begin scraped beef by all means at eleven months;" or, "Dr. Smith says it is terrible to boil milk," etc. In this connection the writer never tries to counsel diet for an out-of-town mother living in a community where she can consult a pediatrist. The passage of time has confirmed him in this point of view. Recently a baby of four months arrived in our community from the West. The weather was hot, the formula was weak, and among other articles of food were stewed peaches and pears. The mother was instructed by her Western pediatrist not to consult a Southern pediatrist unless it was obligatory, because the latter would doubtless interfere with her dietary. The baby fared badly. There are obvious comments.

(2) Enlighten the mother in regard to the meaning of a balanced diet and give her some freedom of choice by explaining classes of foodstuffs rather than stressing articles of food. For example, one mother recently in the writer's practice had given her child no fish in spite of the many that abound in Southern waters, because a Northern pediatrist had particularly and exclusively stressed halibut.

(3) Do not give the mother the idea that early life is blocked off in fixed periods with fixed diets. For the good of the greatest number we standardize, for the good of the individual child we never do. The growth of a healthy child is a marvelous and flower-like unfolding. Therefore the writer feels that one properly constructed diet chart should be devised to meet the needs of all growing children from infancy to adolescence. There are no hard and fast dietetic periods in childhood. The chart on opposite page and continued on top of this page is displayed for criticism and analysis.

Separate pamphlets giving recipes and food preparations in detail are advisable. To the writer's thinking this diet chart presents the following advantages:

(1) One chart for all ages, thereby presenting to the mother's mind the proper conception of dietetics. It also does away with a multitude of printed slips on the desk of the pediatrist.

(2) As simply as possible it portrays classes of foodstuffs, vital contents, and the lists of foodstuffs themselves in systematic fashion.

(3) It provides spacing for kinds and amounts of food and caloric figures when desired or advisable, and is therefore individual.

(4) By no means a negligible feature is the fact that its concluding paragraph permits at any time a rearrangement of diet without suggesting a criticism of past, present or future medical attendants.

In this connection it is not mal a propos to remind ourselves that we must possess more than a bowing acquaintance with the culinary art. There are more cooks among women than among men, but the best cooks are chefs. We should order few foods (here the writer anticipates criticism) that we have not cooked ourselves. Mothers expect—and rightly expect—that we not only tell them what to feed their children, but also how to prepare food most satisfactorily from the standpoint of digestibility and palatability. They wish to know why the longer cereals are cooked the more digestible they are, why spinach is cooked thirty minutes and string beans one to three hours, why green vegetables are carefully cooked in the same waters throughout and at other times in changes of water, why it is best to cook potatoes in their jackets, why more beef juice is obtained from seared meat than raw, why meats for broths are chopped, soaked and cooked in the same waters, and why broths sometimes jell and sometimes do not. It is wise, therefore, to be familiar with a cook book and good treatises on physiology, physiological chemistry, biochemistry, recent advances in the study of nutrition and growth, and last, but not least, psychology.

PART II—DIETETICS AND THE SOUTHERN CHILD

To apply the matter of dietetics more directly to the Southern child, the writer presents the following facts, some of which are obvious, but often forgotten. The Northern child (Emerson) often does his best weight gaining from May to October, the Southern child from October to May. Respiratory diseases are common in the North, intestinal diseases in the South. The climate of many of our Southern states is subtropical, which necessitates light clothing, abundant fluids and low caloric feeding. Fats are often handled with great difficulty and attacks of acidosis are common. Moderate excess of proteins fed early predispose to intestinal putrefaction with coated tongues, low-grade chronic fevers and irritability. Carbohydrates in excess easily produce fermentative diarrhea or constipation with anemia and large abdomens. It must be particularly borne in mind that these excesses, so-called, are often only relative, and apply to types of diet that could easily be handled in the North or West. Anemia is universal and frequently not ascribable to malaria or intestinal parasites. The average Southerner crawls out of bed and seldom leaps forth, whistling, like his Northern brother. Hepatic function is imperfect, pancreatic as well. Too much mercury is used in the South, the writer freely grants, but its wise and moderate exhibition is absolutely essential. Bearing these facts in mind, it is easily understood why many Southern children are anemic, victims of chronic intestinal disorders and malnutrition and exhibit frequent postural defects. Low calory feeding is strictly in order, but starvation carefully to be avoided. Remember also that warm weather in the South is frequently a matter of nine months, that many Southern homes are less clean and less sanitary than Northern homes, that labor is slovenly, milk easy to spoil, and all sorts of noxious bacteria flourish in a moist and torrid atmosphere. Our winters are a different matter, and our best work with the Southern child is naturally done in the cold season. The preceding discus-

sion will doubtless make clear several matters:

(1) Why the Northern pediatrist is so often successful with the Southern child in the North and is prone to forget the local difficulties of his Southern confrere with the same child in the South.

(2) Why, therefore, the Northern pediatrist considers his Southern confrere weak in nutrition and dietetics.

(3) Vice versa, why the Southern pediatrist often considers Northern children overfed and overclad when they come South.

(4) What the Northern pediatrist often does not know, why both Northern and Southern children often become quite ill when they visit, or return to, a semi-tropical climate.

In conclusion, probably no branch of the medical profession is more loyal to its members and proud of its preventive work than the pediatric branch. Misunderstandings are therefore unhappy events. Some of the matters referred to in this paper were briefly and fair-mindedly discussed before this Section last year in connection with a paper on fat intolerance. The writer only wishes to emphasize that:

(1) Our general methods of presenting dietetics to the laity are possibly not wholly perfect.

(2) Sectional variations in diet, often confusing to the mother, are explainable and avoidable.

(3) Lastly, the Southern pediatrist has his own very particular and very difficult problems in dietetics to handle, influenced markedly by local conditions.

De Renne Apartments.

DISCUSSION

Dr. W. A. Mulherin, Augusta, Ga.—It is my conviction that future advancement in the proper feeding of infants and children will be along educational lines as it pertains to the mother. Too frequently have we lost sight of the fact that we are today, in many instances, treating mothers as mere automatons.

With the proper application of Dr. Waring's printed feeding slip, a mother can be taught simple practical dietetics. It will teach her why she uses certain foods, classifying them and showing the ones containing the necessary vitamins. By such satisfactory procedure a pediatrician will be able to secure the intelligent cooperation of the mother, which is so essential to proper feeding in pediatric practice. Again, it will teach the mother just the point Dr. Waring has so well stressed: that it is not so much the single article of diet given the baby as it is the constituents the food contains, and that a generous well-rounded, well-balanced diet is the ideal one.

I feel quite sure that Dr. Waring, in using this diet list, impresses upon the mothers that it is intended for a well baby. Otherwise he might get his little patient in trouble. I feel that the feeding of the well baby and the sick baby are two entirely different things, and this fact should be well impressed upon the mother's mind.

There are a few points in the essayist's paper upon which I do not entirely agree. As regards the use of calomel, I do not think it can be scientifically shown that it makes "the liver" do any better work than that secured from any other cathartic. Therefore, I do not believe the giving of calomel to be essential in the successful handling of children. Also I am of the opinion that it is not necessary to feed our Southern children differently from Northern babies, provided the essentials of infant feeding are adhered to. It is possible that the essayist is inclined to keep the calories a little too low during the summer months. Sound pediatric practice, whether applied to Northern, Eastern, Western or Southern climes, demands that in excessively hot weather more water and less food be given. Therefore, in our Southern climate occasion does arise where this essential in pediatric practice has to be put into operation.

Again, as a general proposition, we all know that it is highly advisable at all times—but especially during the summer months—to begin to feed a baby with a low formula, first teaching it to digest cow's milk, then slowly increasing and adapting the formula to the baby's digestive capacity until our little patient thrives normally. This same general rule should be applied to older children in adding the different foods to their diet, which should be done in teaspoonful portions, until a sufficient amount has been added to the diet.

If this careful method of gradually extending one article of diet at a time until a well-rounded and well-balanced diet has been secured, and one upon which the baby will thrive, I believe our Southern babies will do very much better during the summer season. There was a time when I was deathly afraid of the summer months as they pertained to the feeding of infants and children. Today I feel firmly convinced that the slow, deliberate, intelligent method of extending diet during summer months is better practice than the over-cautious and timid methods that have been practiced in the past.

Dr. R. M. Pollitzer, Charleston, S. C.—We know that many children who are considered well are far from well. If you examine them carefully, weigh and measure them, you will find that a large number of them are suffering from under

nutrition and malnutrition. There are several reasons for this.

In the first place, while a very small group of women have been educated in the general principles of nutrition, the vast majority know nothing except what they have heard in chance conversation and usually misunderstood. One of the commonest of mistakes is that the parents let the baby sit at the table too soon. Just as soon as they are able to sit up alone they are brought to the dining table for convenience sake and permitted shortly thereafter to eat anything and almost everything they see and beg for. Another error or fault in technic is quite the opposite. Although the baby should not go to the table, yet the food should early be taken to the baby. It should not eat what it wants, but should be taught to eat what we wish it to have. At or about the twelfth month, if well, every baby should learn the tase of a variety of foods. If the time is much deferred the little one has become so accustomed to its milk diet that it objects to all solid food. The pediatrician, and more particularly the general practitioner, in order to assist the mother in her work of practical dietetics, must know the caloric value of the common foods, their percentage composition and why certain foods are of more value than others. Fads must be recognized as such. There is a fertile field here for the education of the mothers. They can be taught to rear healthy children, and if we physicians do not teach them others will and we shall have lost an opportunity for doing good.

Dr. John Zahorsky, St. Louis, Mo.—For the young child we know that 85 per cent of its calories must come through the carbohydrates, and these are usually furnished in the form of starches. A good list for a baby five or six months old is to feed starches in the form of gruels or cereals. I find in actual practice we have great difficulty to get these gruels properly prepared, for the reason that the family never has them on the table. I do not know whether it is advisable to keep a baby five, six or seven months old on gruel or to give him a piece of bread to chew on. In either case he gets his carbohydrate, in one in the form of mush and in the other in the form of solid food. I find some families give a piece of bread early, and I do not see that it is harmful. When they come to you at eight or nine months you will find they do not care for oatmeal gruel, but they will eat bread. Is it best to stop the bread eating and to urge the mother to feed cream of wheat or rice, or is it best to feed this child more in the variety of bread? I do not think that has been answered. I know some of the healthiest, best nourished children, who have not taken any cereal in the form of mush for years. Incidentally when taking bread, the dark breads are better.

In recent years we have learned that it is important for the young child to have vegetables. This is knowledge which was obtained by a study of the lower animals. This knowledge has attracted the general public somewhat. I find mothers telling me that they give the children plenty of vegetables. I want to emphasize that vegetables do not furnish nutrition, and many babies are starved by being fed too many vegetables, which fill up the intestinal tract so that there is no room for other food. Children must not be given too many vegetables. I saw two children who were fed almost exclusively on vegetables for a year and their abdomens became enormously distended. Too many vegetables have a tendency to increase the length and also the diameter of the intestines.

The greatest difficulty in feeding a child is the habits of the parents. Where parents eat a rational, good general diet and vary it from time to time as the season changes, we have no difficulty at all in feeding the child.

Dr. L. W. Elias, Asheville, N. C.—It seems reasonable that a baby in the far North would need food differing from that of a baby in New Orleans. Yet when we begin to discuss the difference in food needs of babies in the North and South of the United States we are on theoretical grounds. While we have books on the care and feeding of Southern babies, we have really as yet worked out no fundamental facts regarding any really different food needs of Northern and Southern babies. Dr. Mulherin, of Augusta, Ga., and Dr. Waring, of Savannah, Ga., two pediatricians in practically the same climates, feed entirely differently. Is there a difference in the babies? Is there any difference in our babies and the ones farther North and South? If so we ought to know about it. If not, we ought to keep quiet about it. We have heard quite a little theorizing today, but I should like to see whether some practical work is being done along this line.

Dr. Jerome Meyer, Birmingham, Ala.—I agree with Dr. Waring's observations and suggestions. When suddenly shifted from one of the Northern cities to the mining camps of the Tennessee Company in Birmingham, I have had to change my methods. Certified milk was not available at all the camps, so I was forced to use Dryco and condensed milk and had surprisingly good results. The doctors at the camps also convinced me that their cases could not take care of albumin milk at times when it was specifically indicated.

Dr. Robert A. Strong, Pass Christian, Miss.—Discussions with mothers which are very annoying frequently occur on very insignificant articles of diet. Of course much of this is due to variation of opinion, but one man admitted to me that he frequently put unusual articles into a diet just to make it unique.

The cooking and preparation of the food is most important. Much of the loss of appetite is due to unpalatable food. I think that we should know how to cook before we begin to tell the mother.

Dr. S. G. Glover, Greenville, S. C.—South Carolina is one of the states with the highest infant mortality, roughly 113 per 1000. The mortality rate for the United States at large is 90 per 1000, and New York state 79 or thereabouts, and that includes the high mortality from measles. Now, strange to say, a far away country, New Zealand, has less infant mortality than any other country, due to the welfare work and to education. I am not prepared to give the mortality rate, but I believe it is about 48 per 1000. I mention these

figures because we are still trying to lower our mortality rate, and one of the ways in which I believe it will be done is in connection with this diet list which Dr. Waring has mentioned. Another thing is the nutritional clinic. In addition to the diet one should not overlook exercise, plenty of sleep, cod liver oil and fresh air.

Dr. John Barbee, Knoxville, Tenn.—Common sense is always the guide in infant feeding. I have a friend who was sent by the Government to take care of the feeding problem in Mexico. He told me that where it was so very warm it was very difficult to adhere to the methods taught in the Northern schools regarding raw milk. He found it almost impossible to get the milk to the babies and have it kept at a temperature suitable for digestion. He found he had to get away from modified cow's milk, and he found further that dry milk, especially Dryco, kept well and served better for infant feeding.

During the last year in some work that I have done in connection with a public clinic on child welfare we have had the aid of a follow-up nurse. We had labored for several years to get milk formulas properly prepared by mothers and had often failed. This nurse's duty is to follow up the mothers who are not capable of preparing the milk, and if necessary tell her how to prepare the food, or to mix the food at the clinic, and keep it in the icebox until ready for distribution. In some places we have even given iceboxes to the mothers and supplied them with ice, and have found it worked quite well. Our records show that we have made better progress than under the old method. The nurse has charge of and prepares all milk formulas for the acutely sick or difficult cases.

Dr. B. M. Taylor, Greensboro, Ky.—The greatest problem that faces the South today is not the negro problem. It is the problem of hog fat and half-done bread. I do not know whether you kill hogs in Tennessee, but in Kentucky we kill our hogs, and the hogs get even by killing us. This hog fat is used in cooking. Vegetables cooked in it are not fit to eat. The next problem is the hot biscuits half done. The biscuit is an invention of the South and not of the North. We have not the problem of malnutrition in the North that we have in the South. In my State the greatest problem I have is the problem of teaching the parents that if they will give biscuits they must have them well-done and then not feed the child hog fat.

Dr. W. E. Ross, Jacksonville, Fla.—Coming from an even more Southern point than Dr. Waring, I agree with him that our children do not require the caloric values that children do in Northern climates. There is just one point on which I do not agree with him, that is, that the liver and pancreatic secretions are palpably decreased. If our food values are sufficiently large and we use proper proportions of the different types we shall not find this condition. Another thing is the great predominance in the use of mercury in the South. I think that it is one of the worst things that could happen to a child, this oft repeated free use of mercury. I practically never use it.

Dr. Waring (closing).—The remark in my paper regarding mercury I think was misunderstood. You have to use mercury in children occasionally in small amounts. I do not let the mothers use it.

The point was brought up regarding the gain made by children. The children who go up to the mountains do gain from May to October, but the children who stay home during those months never gain in the same fashion as in winter.

There are one or two points about this diet list that I hoped some one would bring up, because it is a little arbitrary. For instance, I had legumes among the starchy vegetables, because in the last analysis they run 10 to 30 per cent starches and when dried sometimes as high as 50 to 60 per cent. They have a fair percentage of proteins, but the amino acids that result from a breaking down of the legumes do not contain the important elements needed in our digestion.

A word about the original work in the South. I feel very strongly about that, and I put my Southern feelings up with any one, but I think one of the chief troubles with the Southerner is his complacency. In the pediatric field probably that does not hold quite so true as in other things. Wonderful work is being done in St. Louis, where Dr. Marriott is. St. Louis is Middle West. A good deal of work is being done in Baltimore, but through all parts of the real South New Orleans is the only place where very much original work is done in pediatrics. Dr. Hines has brought out the fact that we have a good history and that we have done a good deal in a literary way in pediatrics. I think, however, that the field is still wide open.

THE INFLUENCE OF THE OBSTETRICIAN FOR BREAST FEEDING*

By C. R. Hannah, M.D.,
Dallas, Tex.

The mother's ability to nurse her baby depends largely upon prenatal care. The best results in obstetrics are obtained from those cases who have had personal supervision during gestation. There should be both mental and physical preparation of the mother for labor and lactation.

It is a natural instinct for a mother to want to nurse her baby; and the true obstetrician, realizing his responsibility, will cooperate and direct his patient in the accomplishment of this desire. She wants

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her baby to have a fair start in life and to secure this result breast feeding is necessary.

She should know that in breast-fed babies diseases and complications are less frequent, and that proper food plays an important part in the future health of the individual. The mother's desire for a healthy child will cause her to seek prenatal knowledge that she may better perform her obligation.

In the early months of pregnancy she should be taught those things which have a direct bearing upon her condition. Under proper supervision, giving birth to a child should not necessarily lower her vitality and endurance.

We all know the systemic changes that occur during pregnancy. Soon after conception the mammary glands begin to develop and prepare to perform the function of secreting milk. The obstetrician should inspect glands, looking for inverted nipples and other deformities; and, if these are present, should give instructions to correct the abnormality. Several weeks previous to delivery instructions should be given to apply a lubricant to the nipples and to roll them gently between the thumb and fingers to secure toughness and pliability.

Explain to the prospective mother the advantages of diet and exercise. Walking in moderation develops the abdominal muscles, causes deep breathing and assists in elimination. Adherence to rules and regulations encourages discipline and prepares her mentally and physically for labor. Athletic coaches train their men to enter the contest with their moral and physical condition at their best, and since labor may not differ so materially from a physical contest, it, too, should require in the mother composure of mind, self-control and stamina as well as a physical preparation.

Diet has a direct influence upon the preparation and the ability of the mother to nurse her baby. Prenatal instructions given by physicians are often limited, indefinite and incomplete so that the patient fails to grasp the idea of responsibility to herself and baby. The obstetrician must be specific and detail to her the advantages gained by a well-balanced diet. Probably society suffers more today from incompetency in dietetics than from almost any other inefficiency. Too many of our girls are ignorant, careless or indifferent in the preparation of the food for the home. All maternity patients should be taught the advantages of a balanced diet to maintain health and prevent complications, for an improper diet is usually a source of trouble. During pregnancy they should limit the proteins, reduce the carbohydrates and partake more freely of vegetables and fruit. Try to teach them what a well-balanced diet means. Teach them that during this period they should not wholly refrain from one food and partake excessively of another. A balanced diet consists of proteins, carbohydrates and fats and other essentials necessary for tissue building. They should not partake of one food at the expense of another, for then that element which was lacking in their food will be taken from the tissues to complete the deficiency, which is hazardous in the pregnant condition. Too frequently the individual eats only one or two kinds of food during her pregnancy. A diet which has previously been ample will likewise be sufficient throughout pregnancy. This is important and should be unconditionally supported. Scientific investigators have proven this statement and the clinicians should put it into practice. There is no doubt that over-eating during pregnancy is more likely to give discomfort and be the source of complications than insufficient nourishment.

Of course, we should not go to the extreme and permit our patient to become undernourished. She should exercise care and caution, good judgment and intelligence in her diet. She should know that proteins, if taken in excess, will necessitate an extra amount of work for her liver and kidneys. She should know that carbohydrates have a tendency to increase the weight of the patient and may increase the weight of the fetus, especially in the last weeks of pregnancy. She should no longer be taught to "eat for two" (for there may be more), but to diet in order that she may have a healthy baby and be able to nurse it. Mothers who indulge in carbohydrates and excessive quantities of

food will increase in weight. This should not be permitted beyond a reasonable degree.

The patient who indulges in indigestible and large quantities of food will soon begin to gain rapidly in weight and express a feeling of discomfort. These cases should be individualized. Some should gain considerably in weight, while others should reduce. Those who are underweight should be fed and the diet of those who are overweight and inclined to take on fat should be limited. Too much adipose tissue predisposes to reduction in quality and quantity of milk because the fat cells deposited in the mammary glands may interfere with the development and function of the acini during lactation.

Physiologists are still asking the question and submitting the experiment: "Does the material provided for the growth of the ovum come from the mother's tissues or her blood?" Clinical experience teaches me that the blood plays a greater role than the tissues in furnishing the material provided for the growth of the ovum. To me, there is little difference in the development and nutrition of the fetus a short time before birth from that of the baby for a similar period after labor. The difference is only in the manner and method of feeding the baby. The mother's blood furnishes the nutriment in both instances. Teach the mother that the fetus is as much a baby before as after birth. The only difference is that she recognizes it while *in utero* through the sense of touch and knowledge of pregnancy, while after birth there is the material evidence. This information influences her for lactation.

Extreme exhaustion at labor should be avoided, for it has a direct influence upon the early secretion of both the quantity and quality of the milk. Every precaution should be used from the time the patient comes under the physician's supervision until the baby is born to lessen injury, reduce morbidity and mortality, all of which maintains her courage and has an influence upon breast feeding. The woman whose courage and endurance have been materially reduced, so that she requires several days for return to physical fitness, is not prepared to nurse her baby.

The patient should be taught all the pre-eclamptic symptoms that she may recognize them, and have treatment immediately instituted to prevent them from culminating disastrously. Toxins thrown into the blood from whatever source act as foreign bodies and interfere with that systemic change that takes place in the blood for the formation of milk. Pre-eclamptic symptoms encourage infection, and an infected mother cannot nurse her baby. These complications must be avoided.

The secretion of milk depends upon health, food and developed mammary glands. We should teach the patient that her milk is not in the mammary gland, but rather is formed in the gland and by the action of the acini receives from the blood certain constituents which are compatible with the secretion of these glands. Here we see the result of excellent health wrought by exercise, a balanced diet and other hygienic rules, which means pure blood from which constituents for milk formation will be equally proportioned. The physiological action of the mammary gland is to convert the constituents of the blood into milk for the baby. One fact should be thoroughly established in the mind, which is that the milk is not in the mammary gland, that it is not a reservoir for storing up quantities of milk, but that the mammary gland is a laboratory for the purpose of making milk from those elements it receives from the blood. It is pleasing to note how interested the mother becomes in this process of milk formation. She is vitally alert that she may give her baby a fair start in life. This inspires her to follow explicit directions, to ask and seek further knowledge along this line, and is essential in getting the mother to cooperate in nursing her baby. The medical profession is sometimes too conservative relative to instructing the laity in health preservation in maternal welfare. Instructions given to the public on this subject may be supplemented by physicians instructing their individual cases on milk formation. Knowledge of the subject inspires the woman to do her duty as a mother.

Every obstetrician should have a working knowledge of "The Precursors of the Milk Constituents" as explained by Dr. E. B. Meigs. He advocates that an increase of protein diet will encourage both the quantity and quality of milk. Proteins may be taken in other forms of food than that of milk. Care must be exercised and judgment used not to increase the weight of our patient too materially during lactation, remembering that fat cells may interfere with milk formation. The physiological view is that the lactose, fat, and protein of the milk are respectively derived from the dextrose, phosphatid and free amino-acids of the blood. Many people believe that to increase the quantity of milk, the patient must drink freely of fluids, and especially of milk.

We should not forget the mental side, for the will plays a great role in nursing. The expectant mother's environment should be made pleasant, and during her period of gestation she should be encouraged in all things that are healthful and cheerful. Pain and anxiety interfere with secretion of milk. The mother who is worried does not have justice. She should have the most pleasant surroundings. Her family, her friends and the obstetrician should labor to this end. The sort of friends, the intelligence of the nurse and the personality of the physician all contribute to the success of breast feeding.

We may be ever sanguine of success for breast feeding when the expectant mother has had competent prenatal supervision to eliminate the distressing elements and inspire her with courage and fortitude.

DICUSSION

Dr. Eugene Rosamond, Memphis, Tenn.—Next to our function in treating the public is our function in teaching, and if every young mother were made to understand just what she is going through, just why and just how she may nurse her baby, we would have fewer babies who were artificially fed.

The establishment of lactation is in the hands of the obstetrician. Teaching our nurses all they know about the care of babies and the handling and establishment of lactation is usually in the hands of the obstetrician. It seems to be impossible to have a baby born at home. Especially in large cities all babies are born at the hospital, and the establishment of lactation is in the hands of the trained nurse. The common sense teaching of the fundamentals of what we are trying to do and why we are trying to do it I do not believe has been given to the trained nurse during her training in the hospital. For instance, I believe that the first one hundred nurses you see bathing the nipples of the mother have not the slightest idea why they are doing it. You will find they are cleansing the mother's nipple before putting it in the baby's clean mouth. That is the only reason I find for the nurses washing the nipples before and after the baby nurses. They have no conception at all of why they do things. They have rules and regulations which they follow. Unfortunately, we as pediatricians who deal with the baby after he has gotten away from the mother's breast have lacked a few simple rules and lacked a few simple instructions that might have enabled the mother to understand how to nurse her baby or how to bring about the establishment of lactation.

One other thing, beside the proper care of the breast, which we pay no attention to, is the routine in hospitals of waking the mother at 6 a. m. to wash her face, when otherwise she would not waken before 8 or 9, then coming along at 7 a. m. and waking her again to take her temperature. Another thing is that the food she gets in the hospital is not equal to the food she gets at home. These and many other things are responsible for the failure of mothers to nurse their babies, but by far the most important to my mind is the pernicious habit of the average physician's saying to the mother or the trained nurse, "Let the baby nurse five minutes," "Let it nurse ten minutes," or "Let it nurse fifteen minutes." The production of milk is the same whether it is in a Jersey cow or in the mother. Any old farmer who had a hired man who milked a Jersey cow fifteen minutes and stopped would knock him in the head, yet every day we have babies going out of the hospital who are nursed five minutes or ten minutes or fifteen minutes and no consideration is taken of the slowness with which the baby nurses or the rapidity or the length of time he hangs on to an empty breast, thereby making the nipple sore. That to me is the most important, common sense, every day thing to say in regard to the establishment of lactation.

Dr. Charles Conrad, Harrisonburg, Va.—The greater part of the profession does not spend enough time talking to the patient and instructing her.

Dr. Arthur G. Jacobs, Memphis, Tenn.—The obstetrician is in charge of the baby for a short time after birth, and it is at this particular period that considerable influence can be brought to bear upon breast feeding. Twenty-five years ago it was customary to withhold the breast from the baby for three days, and during this period the baby was given sugar-water, catnip tea, or some similar mixture, the breast not being used at all. After the third day the baby was placed to the breast. It was observed that a great many breasts that had been neglected for three days failed to function, and it was therefore decided to put the baby to the breast at once, in all cases, in order to stimulate milk secretion. This view seemed founded upon proper grounds, and so the baby was placed at the breast immediately after birth with the idea of stimulating milk secretion. In a great many instances water was entirely

withheld with the idea of increasing breast activity to the utmost.

This idea was carried to the extreme. I have seen a number of cases in which dehydration occurred in children during the first two or three days of life, high fever and other evidences of lack of water. I have seen two cases recently in which it was necessary to give intraperitoneal injections of water. A better procedure is to give the baby a certain amount of water and let him use the breast at regular intervals too. If we do not stimulate the breast for the first three days it is liable to lose its function. If we simply put the baby to the breast and it does not get anything for three days, or if it gets very little for three days, it becomes dehydrated and there is an unnecessary loss of weight and the danger of the occurrence of anhydremia and acidosis.

Dr. A. A. Walker, Birmingham, Ala.—It has always appeared to me that the obstetrician had more to do with the establishment of breast feeding than the pediatrician. The most valuable thing to my mind that has come about with reference to breast feeding has been worked out by Dr. Sedgwick, of Minneapolis, who has shown that the proper establishment of breast feeding depends upon nursing or stimulating the breast by nursing, and in this particular he has advocated manual expression of milk as opposed to all other artificial means, such as breast pumps. I, myself, am convinced that many children are unnecessarily weaned because of lack of muscular power, which renders them unable thoroughly to empty the breast at a feeding, as a consequence of which the breast becomes dry. As in the dairy, the best dairy men know that if a cow is not thoroughly milked she will soon stop giving a normal supply of milk.

In the last year or two I have had opportunity to try this manual expression of breast milk, and it is amazing how soon with a slight amount of instruction the mother will become adept at it. I have one case in my charge of a mother who had a very weak, premature baby, who was never able to nurse the breast. On the fourth day she started to feed it with expressed milk. She says if she has another baby she will not let him suck. She has no trouble in getting five ounces of milk by manual expression. It is not possible to go into the technic of manual expression here, but it is amazing what ignorance is displayed by the average trained nurse when she is told to express milk from the mother's breast. They almost invariably do the expression on the gland itself, and not on the nipple as they would in a cow. It is just as logical to squeeze the bag of the cow as it is to squeeze the breast to get milk. I think all obstetricians should read Dr. Sedgwick's work on this subject and should familiarize themselves with manual expression. I dare say they will never again wean a baby simply because it is too weak to nurse.

Dr. Robert A. Strong, Pass Christian, Miss.—I want to disagree with a previous speaker as to the establishment of lactation's being within the province of the obstetrician. I believe the baby should be turned over to the pediatrist as soon as the cord is cut.

It will be of special interest to this Section to consider the recent contribution of Theobald Smith and collaborators in the Department of Animal Pathology of the Rockefeller Institute at Princeton, N. J. He demonstrated the remarkable value of colostrum to the newly-born, not merely as a source of nutriment, but also as a conveyor of highly essential immunity factors. He demonstrated that the calf deprived of colostrum lacked something which prevents intestinal bacteria from multiplying and invading various organs. Diarrhea or scours, as it is termed in veterinary nomenclature, is frequently a serious factor just as it is in babies. Smith found this more common in animals deprived of colostrum. He concludes that its function is protective against infection until other protective functions are developed. These conclusions are further supported by the study of the appearance of agglutinins of the bacillus abortus, one of the disturbing organisms in calves. These anti-bodies do not occur in the blood of normal calves before they receive colostrum. This work supports a long recognized belief, and there can be little doubt that these investigations, although on the calf, warrant greater emphasis on the importance of colostrum in the feeding of the newly-born infant. So give the pediatrist the opportunity to utilize this valuable immunity factor when it is available, in the first few weeks of life.

Dr. J. R. Garber, Birmingham, Ala.—I believe that the pediatrician has the right to demand that the obstetrician teach the mother to become a better mother. I am sorry we have not on the program a corollary paper, entitled, "The Influence of the Pediatrician on the Nursing Mother." The pediatrician forgets that the mother has her future to consider. The obstetrician is concerned in the involution of the arteries and in the welfare of the woman. The pediatrician thinks the mother should get out of bed long before the period of involution demands. He forgets there can be a period of subinvolution. The obstetrician demands that the pediatrician keep his hands off the mother.

We should always examine the breasts in prenatal care to see that there are no defects in the nipples which would prevent the baby from nursing. You can impress a woman very rapidly when it concerns something as near and dear to her as a new-born baby. The mother may tell the obstetrician that she cannot nurse the baby. The obstetrician must do his part with the mother in trying to promote lactation; and if nothing more than this popular "auto-suggestion" theory is used, results may be obtained and incidentally what might be termed "lactation psychology" is given a wholesome impetus.

Dr. B. M. Taylor, Greensburg, Ky.—If we are going to have successful lactation we must begin before labor. The essayist has brought out the matter of diet and the question of food which has to do with the development of the mother and the child. I have been in hopes that some of these men would bring up the question of shock as it has to do with lactation. There is just as much shock in labor as there is in surgery. There is pre-labor shock, that is, the shock the mother

has on her mental make-up from the time she becomes pregnant until she is in labor, and then there is the shock she has during labor. All this has an effect upon her mind and will have, of course, an influence upon lactation. There is just as much shock to a woman in labor as there is in the amputation of the leg without an anesthetic, provided you let her be confined without an anesthetic. She does not recover from that shock during lactation, and how can she have a successful lactation with that mental condition? I am speaking of the women not in the cities, but in the country. I am talking to the country doctors.

There is in every neighborhood not only the careless mother, but the meddlesome neighbor, who as soon as she finds out a woman is pregnant begins to pour out advice. The mother is told that labor is the next thing to hell. It is the next thing to death. That woman has nine months of agony in front of her. Every stitch she puts in the layette is a stitch of worry, and of course it interferes with her health and of course it is bound to interfere with lactation.

As soon as the physician finds she is pregnant she needs to be told to disregard every bit of advice she gets from anyone except him. Treat the meddlesome neighbors kindly, but let their advice have no influence upon her condition. If she will rely upon him and if she will do what he tells her, labor will be a dream instead of a nightmare. He gains her confidence and she dismisses this fear and dread, and she has nothing to do but to eat a well-balanced diet and have a properly developed child. When it comes to labor, what are you going to do? Smoke a cigar in the next room and wait until the nurse calls you? No, stand by the mother and help her out. Give morphin and hyoscin in the first stage and let her know that labor will be a dream. When the first stage is completed use an anesthetic until labor is completed. The woman has nothing to remember about this labor. She does not dread future pregnancies and she is able to nurse her baby without fear or worry.

Dr. W. A. Mulherin, Augusta, Ga.—If all the obstetricians entertained the same ideas as Dr. Hannah, and would put them into active practice, there would exist very little reason for the question to arise as to whether the obstetrician or pediatrician should care for the newly-born.

It is not a question of consideration of the feelings or ideas of the pediatrician or obstetrician, but one of giving the baby his inherent right, proper care and attention during the first and most important days of his or her life. If the obstetrician is qualified to render necessary service, and will give proper time and attention to the newly-born, then he is well within his rights in doing it. If, however, he be not qualified, and not so inclined to give the proper attention, then as a matter of fair play and of conscience let him desist. It is claimed, rightly in some instances, that the newly-born is treated as a by-product; in other words, he receives about the same attention as the placenta. It is in such cases that the pediatricians rightfully object.

This subject might be advantageously handled by a joint symposium on the question. By such arrangement the members of the Section on Pediatrics, with the members of the Section on Obstetrics, would have an opportunity of exchanging and airing their ideas, and a decision would be reached which, in the main, would give the newly-born first consideration. It might be well for us to remember we will never get anywhere with the subject by bickering with one another.

If the symposium did nothing more than call attention to a few well recognized facts, it would serve a useful purpose. These facts are: the vital importance of proper care during the first days of life; every mother, with very few exceptions, can nurse her baby at the breast, when properly coached; every mother's milk agrees with her baby, with very rare exceptions; hunger in babies is oftentimes called colic and treated accordingly, with resulting loss in weight and vitality; complemental breast-feeding, when quantity of breast milk is deficient, is the most successful way of having mothers nurse their babies; healthy nursing babies who do not gain satisfactorily after the mother's milk begins to flow are not doing properly and not being treated fairly.

Dr. Hannah (closing).—I tried to emphasize one point and I hoped the pediatricians would discuss it, and that is the preparation of the mother to secrete milk. I expected that some pediatrician who was well acquainted with the method of milk secretion would explain this subject from a physiological point of view. This information would teach the obstetrician the value of proper preparation of the mother for her future duty of breast feeding.

TROPICAL DISEASES AND PUBLIC HEALTH

FUNDAMENTAL POLICIES INVOLVED IN PUBLIC HEALTH ADMINISTRATION*

By W. S. Leathers, M.D.,
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When considering the question of the exact subject that would afford opportunity for setting forth certain facts which in large measure have been gleaned from personal experience in the organization and in the administration of public health activities, it seemed to me that there is perhaps at this time the greatest necessity for careful consideration and analysis of some of the policies which may be termed fundamental in the administration of public health affairs.

Those of us who have been engaged in public health work during the past decade must realize that as a result of the rapid strides that have been made in health organization there are many unsettled opinions being expressed, untried schemes being practiced, and an immense amount of experimentation being carried on for the purpose of developing what may be designated the best plan or policy, or, I may say, program in public health work. With the rapid development and increased interest in public welfare, differences of opinion are to be anticipated and confusion will inevitably arise in an effort to administer public health work upon as sane and sound a basis as may be possible in view of the rapidly changing conditions in the material development of our country, resulting, in considerable measure, from the broadened vision following in the wake of a great world war.

In the discussion of fundamental policies involved in health administration, I would not like to be understood as attempting to formulate policies which would be applicable under all conditions and with the varying circumstances that would naturally arise with the changes which may be wrought by the advancement in medical science and the knowledge gained by increased experience in preventive medicine, but it would seem possible to formulate certain policies which may be regarded as fundamental in the broader aspects of public health operations. It is from this point of view that I wish to discuss certain policies in health administration.

The organization of a department of health must be effected upon a business basis and with an idea of permanency. There is no business concern or any kind of organization which can hope to be successful otherwise. The weakest link in the chain of public health organization at the present time is the lack of intelligent interest, based upon integrity of purpose, on the part of public officials. The question may then be asked, what steps should be taken or procedure followed to place public health organization upon a plane so that its permanency would be dependent upon scientific achievement rather than upon the dexterity with which a health officer may keep free from political entanglements? In the solution of this important problem, we cannot hope to attain the ideal plan, but when viewed from the standpoint of the tremendous value of health as a basis of happiness and efficiency, it will not be idealistic to assume that some plan can be effected which will assure much greater permanency of organization, provided the public is informed of the results obtained, the cost in relation to value received, and the objectives reached when measured in terms of the expenditure incurred.

When we realize the immense responsibility and rather strenuous life of the health official who endeavors to render the largest possible service to mankind, and the many demands which are made upon his time and energy, many of which are unimportant but which must be heeded, there is one principle that is basic in all

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public health organization, and that is that the machinery for obtaining a definite result should be as simple as is consistent with the solution of the problems involved. All unnecessary routine should be eliminated in public health operations, but due regard should be paid to all fundamentals of procedure which are essential in the keeping of accurate records, making clear to the public the results obtained and in measuring the relative values of the work achieved on the basis of the expenditure incurred.

In reviewing the initial organization of health work in the respective states, one is impressed with the fact that there is a lack in essential uniformity of procedure. In fact, there is an amazing variety of organization, much of which is bound to be ineffective and detrimental to the permanency of health work. In one state there is a commissioner of health with no governing board, and he is responsible so far as his official acts are concerned directly to the people. In another state, there is a commissioner of health with an advisory board, and in each instance the commissioner is appointed by the governor. In other states, the health officer is variously designated as the secretary of the board of health, the executive officer, the director of public health, who may be elected by the board or appointed by the governor.

Likewise the method of appointing a board varies in different states: in one state the entire board may be appointed by the governor; in another state, a majority are appointed by the governor and the minority by the state medical association, while it is the exception that the entire board is recommended and virtually appointed by the state medical association. Incidentally, it may be noted that the members of the board vary in number from three to sixteen. In some instances, the board is composed entirely of physicians, or in part of laymen and in part of physicians, or possibly of laymen, physicians, and representatives from other professions, as, for example, dentistry, engineering, and so forth. In rather exceptional instances, the entire board is appointed at one time, but in most cases different members of the board are appointed annually or periodically.

It is conceded that there should be a keen interest on the part of the chief executive of the state in all of its institutions, but the organization of the health work should be so effected as to avoid unnecessary and undesirable changes in the health organization merely for selfish or political purposes. It would, therefore, seem desirable that the authoritative board of the health department of a state, using the state as a basis for the enunciation of certain fundamental policies, should be so selected as to give it stability in operation and enable it to render the most effective service in an advisory and supervisory capacity to the state health officer.

I think there can be no question about the fact that the great variety of organization which at present exists of the governing board of state health departments and the methods of selection of the state health official must fail to impress the thoughtful citizen in such a way as to increase the respect of the public for health organization. It is self-evident that this respect must be attained to the fullest extent if permanency in health organization is to be obtained. Therefore, the method of selecting the governing board and the state health official must certainly be considered an element in strengthening health departments.

What, then, should be the plan of selecting the board of health and the state health officer? It may be well to refer to three different procedures in the health organization of the different states, namely, the appointment of a commissioner of health by the governor independent of any board and without an advisory board, the appointment of the commissioner of health by the governor with an advisory board, and the appointment of the executive health official with a governing board. The health officer in the latter instance is appointed by the governor or elected by the board. The relative value of these three methods is amenable to differences of opinion in the initial organization of the state health department, but when viewed broadly, and especially from

the point of view of the possible entanglements in the machinery of state government, there can be no better way of selecting the board of health, in my opinion, than by recommendation from the medical association of a state, the appointments to be made so that a majority of old members shall always be retained on the board corresponding to each political administration. This does not preclude having on the board of health lay representation, as, for example, the state superintendent of education as an ex-officio member. I am aware of the fact that the average medical association is not by any means perfect, but it is true that the physicians of a state are the best qualified group that could be assigned to assume responsibility for maintaining proper standards in health organization. The profession is in close touch with the attitude of the public on all problems that pertain to the public welfare, and in the main it has the confidence of the public mind. Therefore, it is logical and proper for the profession to assume a serious attitude in the proper direction of the health problems of the state in the prevention of disease, and, broadly speaking, in the conservation of public health. If this responsibility is not placed upon the medical profession more definitely and with a more far-reaching outlook, I feel that we cannot hope for that kind of permanency in health organization which is essential in maintaining the right kind of health conscience on the part of the public for the betterment of community conditions.

The executive health officer of the state should be chosen in accordance with the above policy, by the governing board of the state health department and, by virtue of his position, be a member of the state board of health. He should be required to make recommendations concerning the health policies of the department and also with reference to the personnel. The state health official is held responsible for the proper execution of the health laws of the state and the results obtained from the money expended. It is, therefore, essential that he be free from influences which would cause inefficiency and ultimate failure in the health machinery of the state.

Much emphasis should be placed in the selection of the health official upon adequate literary and professional training and practical experience in the execution of public health work. If a department of health is to measure up fully to the standard of efficiency which is imperative in securing the results for which it is intended, it can scarcely be expected to do so with an inadequately trained executive. Since the responsibility of securing results is largely dependent upon the personnel which is selected for a department of health, it should be incorporated in the law of the state, or become a fixed policy of the governing board, that the state health executive shall make recommendations relative to the directors of bureaus or divisions of the department. This would make it possible for the governing board to refuse to confirm any particular recommendation, but it would enable the state health official to make a recommendation for any position to be filled. This would certainly increase the efficiency of the state health official in directing the policies of the various bureaus and greatly aid him in using proper judgment in selecting trained personnel.

If health organizations are to function in an efficient manner, it is necessary that the appropriations obtained for health work be provided upon the basis of budgets. This means that the available funds for a particular year shall be analyzed on the basis of relative values in results obtained, and then a budget recommended for the current year can be compared with the preceding year and a program proposed in such a way as to indicate the probable results to be obtained by the appropriation requested. Such a system, when worked out upon a careful basis and followed with reasonable uniformity by the different states or health jurisdictions with sufficiently similar conditions for comparison, would make it practicable to measure in terms of the financial output the value received. This would be of decided value in stimulating interest in public health work and increasing the confidence of the people in the work done and health programs that are advised.

In order to present the problem and support the claims for public funds, a health

official must show the object of the thing to be purchased, the character of expenditure, the functions served, the bureau or organization responsible for the service and the fund to which it is chargeable. The adoption of the budget system for a state means that there will be public hearings before those from whom appropriations are to be obtained. The budget system requires a health official to study the history of his department, to think in terms of work to be achieved, and compare his own results with those of his neighbor. It is, therefore, desirable that departments of health working under similar jurisdictions shall have as much uniformity as practicable in the handling and dispensing of public funds. It is perfectly obvious that the budget system is a plan for immediate development. Uniformity in rendering accounts for health work is indispensable. Health officials must specify their needs and express them upon a business basis. Without a budget system the recommendations of the health official are likely to lack responsible revision and approval by the chief executive of the state. Thus the budget appropriation act should reveal the complete health organization for which funds are to be obtained. This should be presented to the chief executive of the state for his approval in order that he may request the legislature to supply the funds needed.

The remarkable development in public health work during recent years has created a demand for trained health officials which greatly exceeds the supply. This is placing a hardship upon health departments in securing persons who are specially trained for public health work which, unless carefully guarded, will result in disastrous inefficiency and a reaction on the part of the public mind relative to appropriations requested and programs of health work advised. It is, therefore, fundamental that state health departments shall adopt a policy for providing a more adequately trained personnel.

One of the most encouraging developments in hygiene and public health within the last few years has been the organization of schools of hygiene and public health such as is being conducted at Johns Hopkins University and in a less specialized sense as departments of hygiene in a number of other institutions. The variety of courses which is being given, particularly at Johns Hopkins, in the School of Hygiene and Public Health, provides a plan by which it is possible for departments of health to adopt a policy of giving the men on the permanent staff opportunities periodically for acquiring advanced training and additional preparation in their particular lines. It would certainly be an admirable policy for any state or department of health to pursue a plan by which the men engaged in health work should be given leaves of absence for short courses on full salary, for special training and gaining renewed interest and inspiration in their work. A scheme of training public health officials may be briefly outlined as follows:

(1) Institutes in the respective states for limited periods of time during each year;

(2) Courses in hygiene and public health in state universities with special reference to training health assistants and also health officers;

(3) Short courses of intensive instruction in institutions having adequate facilities in teaching personnel and equipment;

(4) Advanced courses in public health training leading to the degree of Doctor of Public Health in state and endowed universities; and

(5) Provision should be made not only in institutions of learning for research work in preventive medicine, but opportunity should also be afforded in the respective states for research work in the hygienic laboratory, and also for the investigation of the best plans and methods in field operations. In this connection, departments of health should afford every opportunity for medical students, and the laity who may be especially efficient in subordinate positions of public health work, to obtain such training as may be desirable in providing adequate personnel for health departments.

The organization of a department of health into bureaus or divisions in its ul-

timate analysis has for its main objectives the reduction of infant mortality, the prevention and correction of mental and physical defects in the child, the prevention and control of infectious diseases, and the development and maintenance of the proper health conscience among the individuals of the community in the conservation of their health.

With the above aims and objectives to be attained, the health organization that approaches a proper standard must include the following fundamental parts or divisions: administration, health publicity and education, vital statistics, laboratory of hygiene, sanitary engineering, general and food inspection, child hygiene, industrial hygiene, public health nursing, epidemiology, social diseases, tuberculosis, and county health work. These fundamental divisions could not be considered as of the same relative importance in different states. For example, in some states industrial hygiene should be greatly emphasized, while in others it is of negligible importance. On the other hand, malaria control work may be considered a major problem in some sections and could be rightfully considered for a division of health organization. Again, hospital relief is of much greater import in states with congested centers of population than in those with more strictly rural conditions.

It is true that the central administrative machinery of the average state health organization has been more extensively developed during the past decade than local health organizations, because this period represents the pioneer stage in the development of modern health work. As the evolution of efficient health work is effected, greater emphasis must be placed, relatively speaking, upon the enlargement of local health organizations than upon the continued expansion of the central organization. While it is important that sufficient and adequate support be given to state departments of health, strength that may be developed through a central organization should never assume the form of too great centralization of power, or bureaucracy. We should not lose sight of the fact that a fundamental policy in health work is to advocate that the local departments of health be governed by those who are especially concerned, and the central organization should be used for making and enforcing laws, initiating and developing health work, and for formulating plans and policies in an advisory and supervisory capacity.

In enlarging and making more effective the health organization of a state, it is not possible to escape the fundamental policy that the county should be the unit of organization. It may be necessary for two or more counties which are small, and not wealthy, to combine and constitute a sanitary district. Incidentally the similarity of conditions between counties would be more striking than between larger units of government, and, therefore, would offer the best conditions for standardization of health activities.

The formulation of budgets for county health departments must be developed upon a more economical scale than would be possible in many of the municipal health departments. This is due to the fact that the relative per capita wealth in the rural area is usually less than the urban per capita wealth. Provision should be made for cities of fifty to one hundred thousand population and over to develop a health department independent of the rural area of the county, but in counties with cities less than fifty to one hundred thousand in population, the county health organization should include towns and cities and in developing a budget it would not be improper to have the larger towns contribute a certain amount in order to develop a budget sufficiently large to execute the work upon a more intensive basis. While any plan of health work in a county, such as units of health work, or child welfare work, or public health nursing, should be advocated, the ultimate objective should be the larger development of county health work looking to the organization of a department of health with an all-time director in charge, a nurse, and a clerk-microscopist, as a minimum staff.

Many of the states are urging the selection of what has been termed all-time county health officers for each county. In

view of the scarcity of trained health officials and inadequate facilities for training a sufficient personnel to man such positions, it is clearly advisable to use a conservative policy in undertaking such a tremendous task at this time. There is every reason to believe that this is the ultimate development in doubtless all of the states—at least the outlook is most encouraging—but it would seem the better part of wisdom to proceed in a rather deliberate way in initiating and developing county departments of health. It may be approached most effectively over a period of years rather than in a more limited time. The fundamental principle to keep in mind is that the permanency of county health organization will depend almost entirely upon the administrative ability, training in health work, and skill of the physician selected as director of the work. In order to invite the best talent for such positions, it is essential that there be an assurance of reasonable permanency. In order to guarantee greater permanency of organization, there should be some plan developed, certainly in cooperation with the state government, and better in cooperation with the Federal, state and county governments, for the financing of county departments of health. Instead of having the wasteful system of part-time county health officers, it would be a more economical policy for a state to provide a plan by which a certain number of counties each year would have the privilege of organizing departments of health with all-time directors in charge, financed cooperatively either by the state and county governments, or what is even better, by the Federal, state, and county governments. A county should be required to appropriate at least 50 per cent of the total budget and the remainder be divided equally between the Federal and state governments. This would doubtless insure efficiency in health work because of the greater permanency of organization, and it would afford a more inviting field to the best talent for doing constructive health work. In having a cooperative program of work for a county based upon a simple and yet comprehensive machine, such as has been above suggested, there would be small opportunity for lost motion as a result of undue political interference. It does not seem to me practicable to develop the kind of efficient health work which is so necessary in the prevention and control of disease and the promotion of the public health without some such system.

While there are phases of health work that must constitute a part of the program of county health work as a universal policy, there are aspects of the health program which are peculiar to each state, and there are also conditions in the respective counties of a state which necessitate a variation in the program. I think it is exceedingly important that the program of the health work of a county be so varied during the year as to introduce sufficient variety to retain and stimulate the interest of the citizenship and to meet the emergency situations which may arise from time to time in accordance with the chronological order in disease incidence.

Just as there should be close correlation between the different bureaus or divisions of the central organization of the state health department, it is of immense importance that there be close supervision of the local health organizations, and in turn, they should be coordinated with the central organization in the general scheme of state health work.

There are certain fundamental principles which collectively constitute the general policy of health administration. There is one point which I wish to refer to particularly in this connection, and which I think has much to do with the successful directing of administrative affairs, and that is the proper adjustment of the assistance which may be given by the executive officer to the directors of the different bureaus and the credit which may be accorded them for the work accomplished. "Too much supervision tends to throttle individuality, to diminish pride of accomplishment, and to decrease confidence in attainment. On the other hand, too little supervision will not infrequently result in a waste in expenditure and lost motion in organized effort." I am confident that there can be no greater incentive for work on the part of those who may be

associated in an organization than the proper recognition of individual achievement. It seems to me that there should be a liberal and unselfish policy on the part of the chief executive of a state health department in his relation to the members of his staff.

The execution of public health work upon a scientific and economical basis is impossible without approximately reliable morbidity reports. These should be obtained not only from the physician, but from parents, superintendents of schools, heads of institutions, and others who occupy positions of responsibility in relation to groups of individuals. I doubt that there is a more difficult problem in the operation of a health department than the collection of reasonably accurate morbidity statistics. In the collection of such data there are two main objectives to be kept in mind: first, the study of the chronological order in disease incidence, noting seasonal, monthly and annual variation, and so forth, with the view of properly interpreting the conditions responsible for any variation noted; second, the location if possible of the source of infection and the institution of measures for controlling it. It is doubtful whether it is advisable to require at this time in the plan of collecting morbidity data a prompt reporting of diseases that do not run an acute course. It would appear to me to be a useless procedure to request a physician or anyone else to make an immediate report of the occurrence of a disease unless prompt and scientific measures are used to prevent and control it. In other words, what use can there be in having a physician make a report of a disease as soon as suspected or diagnosed unless steps are taken to control the disease? It is a fact that too little emphasis is placed upon the control of disease at its source, and if the acute infectious diseases are to be suppressed and kept under control it is imperative that there should be close correlation between the health official and the physician in not only securing a prompt report as to the outbreak of an acute infectious disease, but also in its actual prevention. It would, therefore, follow that obtaining prompt morbidity reports of acute infectious diseases has little justification except upon a basis that such information is utilized in the prevention, control and ultimate suppression of infection.

With the increased appropriations and enlarged state and local health departments, new problems have arisen involving a more exact relation between the health officer, the physician, and community life. One of the phases of health work that has developed in a concrete way within recent years is child hygiene, including the medical examination of school children. Bureaus of child hygiene have been organized in departments of health in about forty-one states. In some states this work includes the general activities that pertain to child health. In other states there has been developed a more intensive plan which involves the supervision of midwives, nutrition conferences, and medical examination of school children. With this new phase of public health work, unfortunately the term "clinic" has been used to indicate that certain corrective work is being done, not primarily through the health department but by utilization of the talent and skill of specialists and local physicians. It is conceded that the inspection of schools and the medical examination of school children is a function of the health department, and it has been shown by the examination of many millions of children that unless proper follow-up methods are used to obtain correction of physical defects by the health department and other agencies that may be employed, only about 10 per cent of corrections can be expected. When it is realized that the examination of the school children of the state involves many hundreds of thousands of children, and that this work will have a most far-reaching effect toward the protection of the health of the child, it is obviously a great waste in time and money to the state unless it be followed up and unless intelligent and sympathetic cooperation be obtained from the practicing physician in securing a large percentage of corrections.

While the health officer should use his ingenuity in effecting this result, under no circumstances should any of the corrective work be done by a representative of the

health department. This should be accomplished through the cooperation of the local physician and when necessary the utilization of specialists. In other words, it is distinctly the function of the medical profession to be entirely responsible for such corrective work as may be desirable following medical examination of school children and the remuneration for such service should be left entirely to the physician and patient. The selection of the physician or specialist should be done independently of any suggestion or advice of a representative of the state or local health department. However, there may be circumstances involving the question of right and justice to medical ethics causing one to express an opinion, but as a matter of policy this should be left to the discretion and judgment of the patient and the practicing physician.

It would seem to me to be out of keeping with the dignity of a great profession to utilize any opportunity or follow any plan which would involve a uniform fee system for such work, but, on the other hand, the doing of corrective work for pay patients or those that may be indigent should be, as in private practice, left to the integrity and spirit of service of the practicing physician, in the betterment of community life. If corrective work is done upon such a basis, there can be no just reason for the physician's objecting to the methods employed or failing to give his hearty support and cooperation to the public health officer in his effort to conserve the greatest potential asset of the state, child health.

In concluding, I should like to refer to one other subject which deserves a great deal more attention than has been given it in the development of a public health organization of a state: that is, the hygienic laboratory from the standpoint of extending its operations so that it would come more intimately in touch not only with the medical profession, but also with the citizenship of the state. In most of the states the laboratory is located at some central point, usually the capital, and in the main the work carried on in the central laboratory is very much the same in those states where this phase of health work has received the usual emphasis. We should remember that this country has occupied the position of leadership in the development of laboratories in relation to public health and that more emphasis has been given to the diagnosis, prevention and cure of disease through hygienic laboratories in the United States than in any other country. But, regardless of this fact, too little emphasis is being placed upon the development of an adequate laboratory system as a part of a public health program when it is realized that there is, perhaps, no phase of public health work which will give greater interest and serve to inspire more loyalty from the medical profession than the aid which may be extended them through the laboratories in making an early diagnosis of disease and in the prevention of its spread.

It would, therefore, seem logical that state departments of health should establish as rapidly as possible branch laboratories in different sections of a state, and also advocate, when feasible, the organization of laboratories as a part of local health departments. The projection and development of the above plan of laboratories is being initiated in a measure in certain states at the present time, but while there are many laboratories of hygiene that are efficient and covering a large scope of work, it is nevertheless true that the more extensive plan of laboratory work is as yet in its incipiency. Moreover, the aid which may be afforded physicians through the laboratories will greatly serve to interest and obtain the cooperation of the general public in the promotion and enlargement of the broader program of public health work.

It is imperative that all public health policies shall be founded upon principles which will at all times conserve the interest of the practitioner of medicine. This implies two obligations: a responsibility to be assumed by the health officer in the conservation of the public health with due regard for the practitioner, and, on the other hand, a responsibility on the part of the physician to sustain a broad-minded, liberal attitude toward the health officer in his effort to adjust his relation to the public welfare and at the same time conserve the interest of the practicing physician.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

ACUTE OSTEOMYELITIS*

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The treatment of a number of surgical diseases has become fairly well established and standardized during the last few years. Despite the amount of clinical experience which has been gained by careful study of different groups of cases of acute osteomyelitis and the experimental work that has been performed, there is still a wide divergence of opinion as to the procedure that should be followed in cases of acute osteomyelitis in the stage at which they are most frequently seen.

The embolic origin of the disease and its relation to suppurating foci in different parts of the body have been definitely established. The process which determines the size of the sequestrum is not definitely determined, for cases are observed in which a fairly large area has been stripped of its periosteum without a large sequestrum's forming; and in one instance as much as two-thirds of the marrow of the left humerus was found to be suppurating and dead. No sequestration of the shaft occurred in this case.

The intelligent treatment of acute osteomyelitis depends upon an accurate knowledge of the directions in which the inflammatory process may spread when once established; upon an early diagnosis and the recognition of the complications which may arise and the sequelae which may follow. Treatment should be directed toward the prevention of general sepsis, the formation of large sequestra, the involvement of neighboring joints, and disabilities due to involvement of neighboring joints and cicatricial changes in the muscles adjacent to the bone involved.

It has been generally accepted that a suppurating focus situated upon the shaft side of the epiphyseal cartilage may, by its extension, cause: (1) a medullary phlegmon; (2) by extension along the epiphyseal cartilage a separation of the epiphysis; (3) by passing through the epiphyseal cartilage where pierced by canals for blood vessels an inflammation of the epiphysis; (4) by extension through the epiphysis a suppurative arthritis; or (5) by passing along the epiphyseal cartilage and rupturing through the periosteum an intra- or extra-articular abscess, depending upon its relation to the attachment of the capsular ligament. These are the directions of extension which have been especially emphasized, attention being especially directed to the possibility of early involvement of the marrow cavity. The possibility of such an extension and its supposed early occurrence probably accounts for the wide adoption of early removal of the cortex of bone with exposure and drainage of the marrow cavity. If such is the common and early mode of extension such an operation is certainly indicated.

Recently evidence has been offered especially by Starr and Speed which indicates that the inflammatory process beginning in the cancellous bone on the shaft side of the epiphyseal cartilage extends along this cartilage to reach the under surface of the periosteum which is attached to the cartilage. The periosteum is stripped from the bone by the inflammatory products. As tension increases beneath the periosteum the infection spreads back through the vessels of the Haversian canals to reach the marrow cavity. The spotted appearance of the marrow seems to justify this conclusion. These conclusions reached by Starr and Speed are based upon x-ray pictures of cases of acute osteomyelitis and tissues removed. X-ray pictures in cases of osteomyelitis all show much the same findings. The changes extend farther upon the periosteal than

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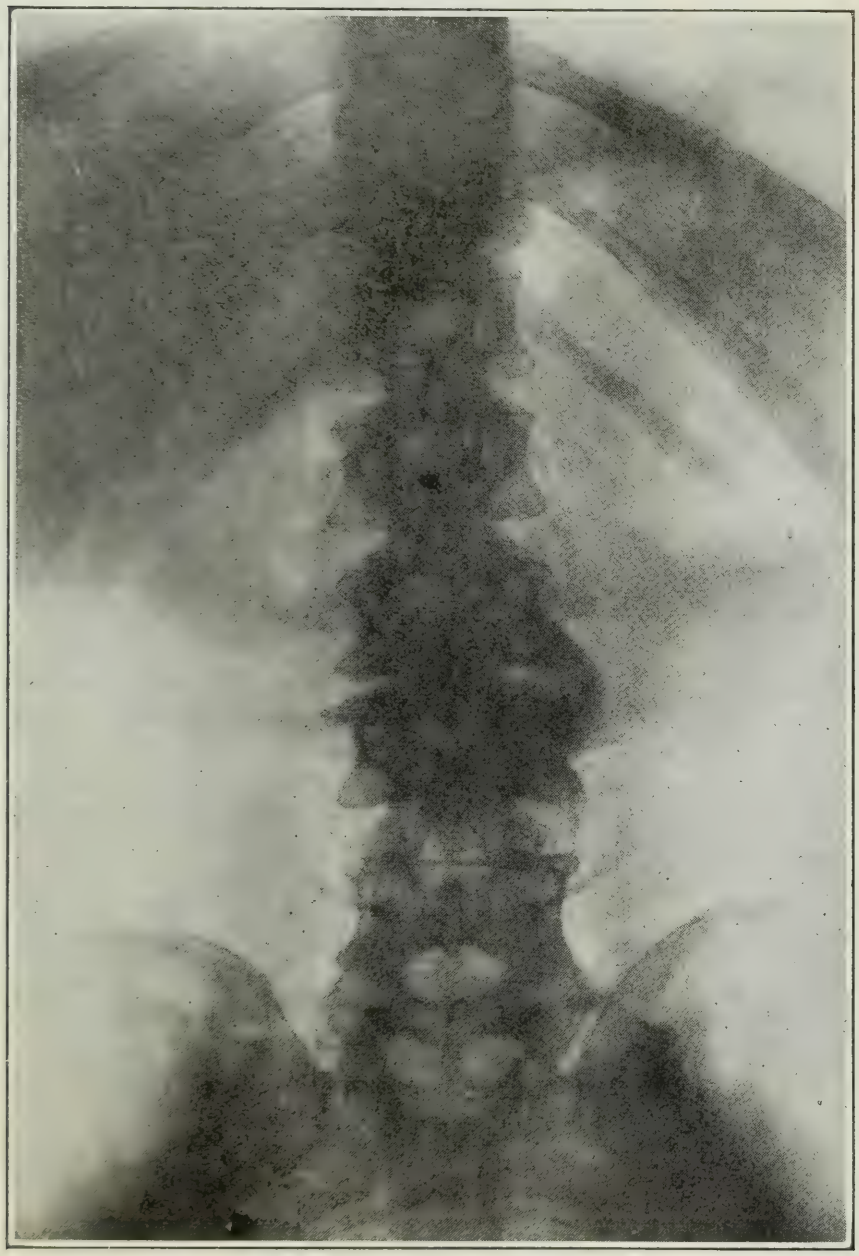
medullary surface, the periosteum usually being stripped farther upon one than the other side. The cortical bone which has become dead as the result of infection and periosteal stripping is usually wedge-shaped, the base being directed toward the epiphysis, and the apex downward on one side of the shaft. As already mentioned, the spotted appearance of the marrow would seem to indicate that the inflammatory process may have passed backward through the vessels of the Haversian canals to the marrow, a method of extension not recognized by surgeons a relatively few years ago, who taught that the infection extended from the marrow through the vessels of the Haversian canals to beneath the periosteum.



25809-A.—Osteomyelitis of second and third lumbar vertebrae. Acute onset with some evidence of meningitis. Drainage of abscess at first operation followed in some weeks by second operation, when drainage track was enlarged. Later some small sequestra were removed after they had become separated.

These different methods of extension have been mentioned because the line of treatment to be pursued will depend somewhat upon the path followed in the extension of the inflammation from the primary location.

It is still true in spite of the emphasis that has been laid upon the early diagnosis of acute oeteomyelitis that cases reach the surgeon too late, when damage which is irreparable has already occurred.

What are the factors which cause necrosis of bone and how can they be avoided? The factors causing death of bone in osteomyelitis are not well understood. Statistics which will be quoted later show that extensive necrosis may occur after the marrow cavity is opened and drainage established and that the necrosis may be limited in extent when the periosteum is simply opened and a subperiosteal abscess drained. In some cases in which necrosis of some extent has occurred, the question arises as to whether it may not be due to embolism of one of the larger arteries; infarction of a large piece of the bone followed by infection occurring. The suggestion that the extent of sequestration may depend in some cases upon embolism of the artery has not received much consideration, but it cannot be dismissed without some discussion. If such does happen, the amount of necrosis which occurs is determined when the disease begins.

Such is not, however, so in the majority of cases and the extent of sequestration and the disability depend upon the time at which treatment is instituted. Therefore the outcome depends upon the early

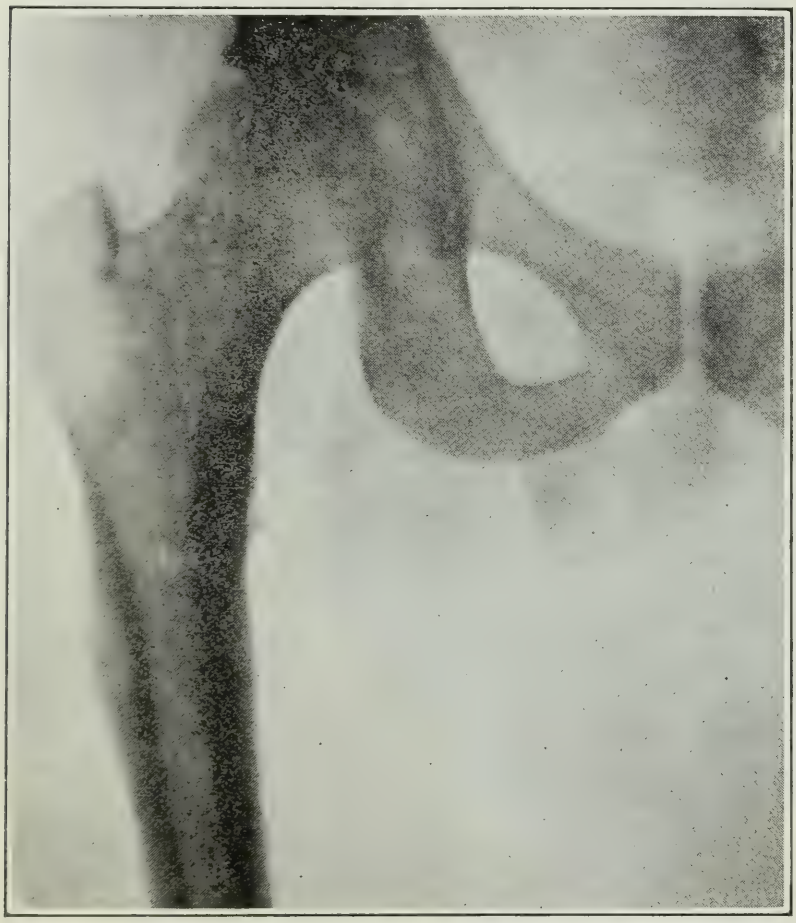
recognition of the disease. The best results should be obtained when treatment is instituted while the inflammatory lesion is still confined to the cancellous tissue of the metaphysis.

The diagnosis must be made upon the deep-boring pain, the localized tenderness over the focus, and the possibility of a primary focus of infection, from which the infected or bacterial embolus was set loose. In some ways, I believe that the introduction of the x-ray has interfered with the early diagnosis of osteomyelitis. The changes occurring in bone in osteomyelitis cannot be determined until very definite changes have occurred between living and dead bone. These changes occur as late as the fifth day, by which time the clinical symptoms and signs should be so definite that the possibility of a mistake in or failure to make a diagnosis should be excluded. The clinical symptoms—pain, localized tenderness over the seat of the infection and temperature—must be relied upon. The clinical picture is so definite that there is but little doubt in most cases. A suppurative arthritis can be excluded because motion at the joint is but little restricted, if at all, and there are none of the usual symptoms associated with an arthritis. It is strange that in most of the late cases which are seen, even at the present time, a diagnosis of rheumatism has been made. There is such a distinct clinical difference between the two diseases that one would think it hardly possible at the present time that such a mistake would be made.

The early diagnosis is of especial importance. The prevention of deformities is important. Deformities, usually flexion contractures, occurring in the course of osteomyelitis can be prevented. The doctor in charge is, in the great majority of cases, responsible for them when they occur. It has been my experience that suppurative arthritis but rarely occurs in the course of osteomyelitis. It may occur either as the result of extension of the inflammatory process through the epiphysis or as the result of hematogenous infection. Suppurative arthritis does occur in young children in streptococcic and pneumococcic osteomyelitis. In this type of osteomyelitis the focus in the epiphysis not infrequently ruptures beneath the capsular ligament, a suppurative arthritis developing. In many cases in very young children the clinical picture of the arthritis predominates and the small focus of osteomyelitis is often overlooked. The joint is drained and drainage continues until the sequestrum is removed.

27615.—Osteomyelitis of spine of second lumbar vertebra. Several small openings may be seen in the spinous process. Osteomyelitis followed an injury sustained while wrestling when the patient had boils. Cavities in the spinous process were filled with granulation tissue. A mass developed in the subcutaneous tissues over the diseased spine. This proved to be granulation tissue surrounded by fat and connective tissue. No suppuration. Staphylococcus aureus recovered from the tissues. Recovery after removal of the spine of the vertebra.

In older children, however, the changes in the joint are not suppurative in character. What may be called a catarrhal synovitis develops. As the fluid increases in amount a flexion contracture of the joint develops, and unless methods are employed to correct the deformity it may become permanent or partial subluxations may develop. As soon as these changes are noticed extension should be applied. Cast fixation does not suffice. In some cases in which the osteomyelitis has involved the entire shaft of the tibia, for example, it may be impossible to apply extension and cast fixation may be necessary. Extension is preferable in all cases of acute arthritis in which an attempt is made to preserve motion. If ankylosis is desired a cast should be applied. Failure to prevent flexion contractures accounts for much of the disability that occurs in osteomyelitis. It should be easily prevented. Once developed, it is difficult to correct, and joint resection or an arthroplasty may be necessary.

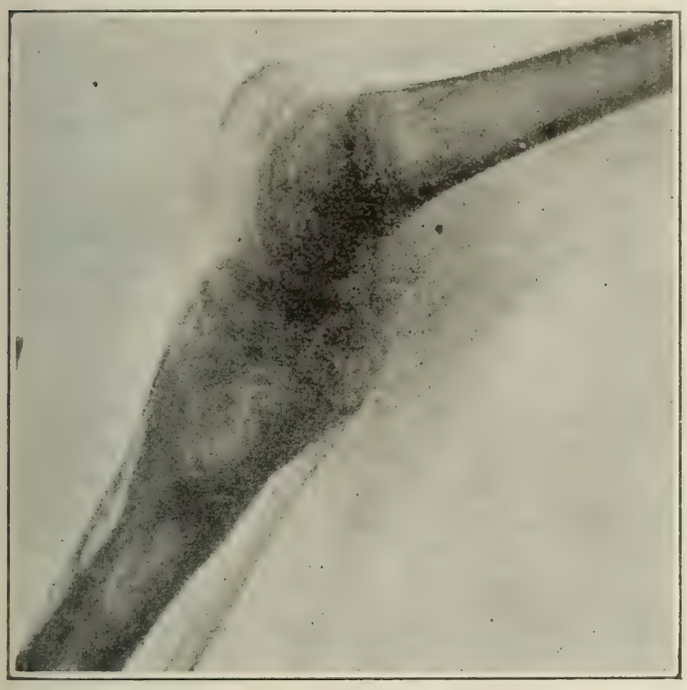


28391.—Osteomyelitis of the femur in a patient 37 years of age. Osteomyelitis of five weeks' duration. Attempt at removal en bloc of osteomyelitic focus. Submuscular abscess. Closure without drainage with healing.

If in some cases the damage is done early, in by far the greater majority of cases the amount of sequestration and disability may be greatly lessened by an early diagnosis and keeping in mind the complications which may arise and the methods to be employed to correct them when they develop. Early diagnosis and avoidance of complication are the important things in the treatment of acute osteomyelitis. The diagnosis having been made, the treatment instituted should aim to prevent general infection and extensive sequestrum formation, the formation and persistence of sinuses, and to prevent the disability associated with deformities and interference with muscles. It has been previously stated that there is a wide divergence of opinion among surgeons as to the treatment to be pursued. This divergence of opinion is probably due to the fact that they have been dealing with the disease in different stages, with disease due to organisms of different virulence occurring in patients with different degrees of resistance. Controls are obtained with difficulty in clinical medicine and surgery.

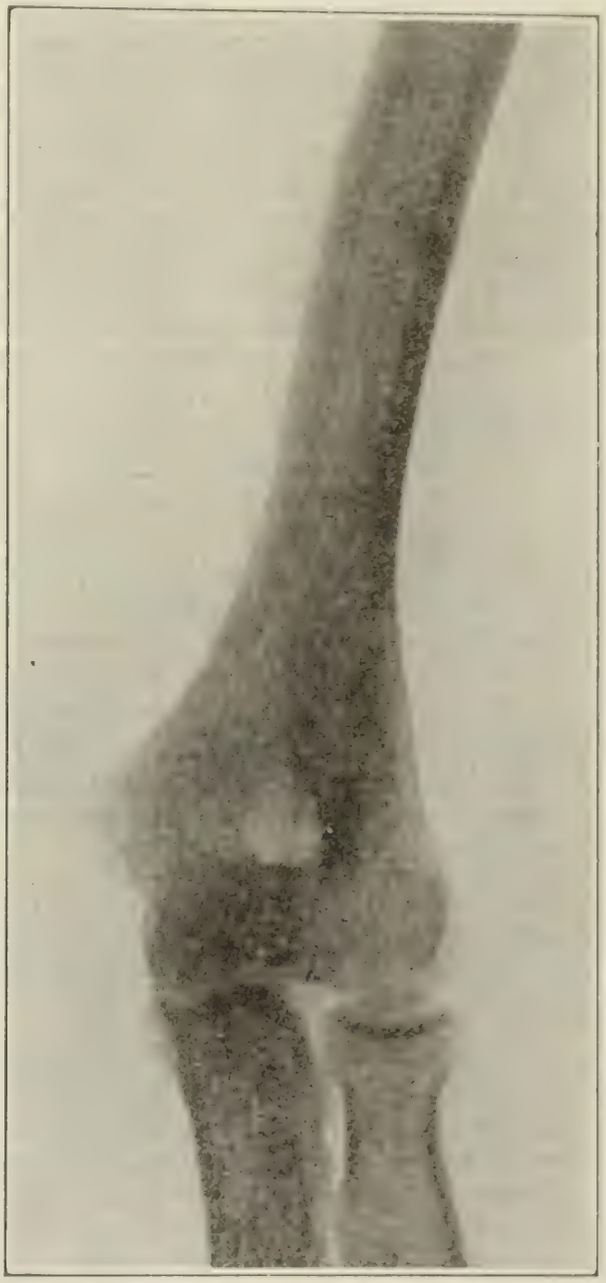
The type of osteomyelitis not uncommonly seen is one in which the periosteum has been separated from the cortical bone for a considerable distance. Almost the entire length of one surface of the cortex may be denuded. In the advanced case practically the entire shaft may be dead, a total sequestrum having formed. Two different kinds of treatment may be followed in such a case. The periosteum may be divided and some cortical bone removed to permit of drainage of the marrow cavity. Another operation will have to be performed to remove the sequestrum, which will have to be delayed until the sequestrum is detached. In the early cases I have had difficulty in determining whether bone is dead or alive and in some cases in which I have left bone which I

thought was dead but not sufficiently separated to permit of easy removal, I have been surprised to find that such bone lived and took part in active repair. The x-ray is a valuable and reliable aid in the recognition of sequestra. As Phemister has emphasized, the recognition of dead bone is based upon changes in density, contour and demarcation. With the aid of the x-ray, sequestra may be recognized and before an operation is undertaken they should be accurately located and counted. A sequestrum may be differentiated from living bone, as just stated, by changes in density, by its demarcation and contour. The se-



19243-B.—Osteomyelitis of tibia. Patient operated upon late after incision of subperiosteal abscess. Extension to knee joint with involvement of external condyle with sequestrum formation. Deformity in knee joint could have been prevented by early extension—separating joint surfaces and preventing contractures.

questrum casts a denser shadow than the surrounding living bone. The living bone atrophies as a result of disuse and lime salts are absorbed. The sequestrum is cut off from the circulation and lime salts are absorbed. The sequestrum is separated from living bone by granulation tissue, so there is a definite line of demarcation. The edges of the sequestrum appear as if gnawed or eaten because the granulation tissue has destroyed irregularly the surface and edges of the sequestrum next to the living bone. These changes should be kept in mind and before undertaking an operation to remove sequestra in cases of acute osteomyelitis they should be carefully identified both as to position and number. Failure to identify them accounts for many of the failures in the treatment of the type of case now under discussion.



28975.—Subperiosteal abscess of the humerus. Associated with considerable bone formation. Marked infiltration of the brachialis anticus and biceps causing flexion contracture at the elbow. Infiltration of the brachialis antigus simulating somewhat myositis ossificans.

Those advocating the more radical treatment claim that immediate recovery is hastened and the best functional results obtained if the entire thickness of the bone over which the periosteum does not exhibit a normal degree of attachment is removed.

The entire length of the bone is not removed. Early immediate recovery with good functional results has been urged as the advantages of this operation. When a resection such as is advocated in the radical operation is attempted bone does not always regenerate. This failure of regeneration, it must be admitted, occurs much less frequently in children than in adults. It has been claimed that inflammation promotes bone formation, but this is not always the case and the radical operation is advised by some on this account, because they think that bone formation is delayed or prevented by long-continued suppuration. Regeneration of the inflamed periosteum after removal of the shaft in osteomyelitis is often incomplete. It may be stimulated to new growth by the inflammatory process, but it often happens that the periosteum is dead to a greater or less extent. This is especially apt to be the case when a subperiosteal abscess has ruptured through the periosteum and separated it from the soft tissues for a considerable distance. The periosteum in such cases as these is deprived of its vascular supply obtained from the soft tissues. Such separation and death of the periosteum probably occur most frequently in those cases which have been treated for some time by poultices.

Failure of regeneration of the periosteum with subsequent non-union is one of the great disadvantages of the radical operation.

Another disadvantage is the difficulty of preventing deformities during the regeneration of the periosteal tube when the bone has been resected. It may be argued that quicker recovery and a shorter period in the hospital outweigh any of the disadvantages associated with the added care necessary to prevent deformities during repair.

The mortality accompanying the radical operation seems to me high. Mitchell, an advocate of the radical procedure, states that he has performed a complete resection of 10 tibiae, death occurring twice, and a partial resection of 6 tibiae, death occurring twice. This seems to me an exceedingly high mortality, but Mitchell states that he does not regard a mortality of 25 per cent as high when the nature of the disease is taken into account and that he does not believe that a much lower mortality can be looked for. This mortality is, however, high unless the infection in Mitchell's cases was exceedingly virulent, and such a mortality is a strong argument against the radical procedure, even if the immediate recovery was hastened and the disability somewhat reduced.

If the ideal operation is to be performed an early diagnosis must be made. The inflammatory process must be confined to the cancellous tissue of the metaphysis when the operation is undertaken. As osteomyelitis is but rarely seen in this stage, but most frequently when a subperiosteal abscess has formed, the operation of drilling into the cancellous tissue or exposing it by chisel is not frequently possible. If seen in the early stage exposure and drainage of the focus in the cancellous bone may limit to a marked degree the course of the disease and the extent of the necrosis. It is generally advised that when a subperiosteal abscess has formed the bone should be opened to permit of exposure and drainage of the marrow cavity. Early and wide opening of the marrow has been advised by Lexer, Koenig, Shmieden, Kirschner and others, while other surgeons have advocated exposure of the marrow only when there is evidence that the marrow is suppurating, while still other surgeons advocate exposure of the marrow when the fever does not subside and the general symptoms do not improve after incision of the subperiosteal abscess. Such a diversity of opinion among surgeons concerning the treatment of a relatively common disease is rather remarkable. Rast has studied the results of operation in 226 cases of acute osteomyelitis. In seventy of these the marrow cavity was exposed. Ten of these patients died, giving a mortality of 14 per cent. In 156 cases the marrow cavity was not exposed, the subperiosteal abscess being merely drained by free incision of the periosteum. Twelve of these patients died, giving a mortality of 7 per cent. From 1911 to 1917, 80 cases were treated by incision of the periosteum, thus drain-

ing the subperiosteal abscess. Five of these cases died, a mortality of a little over 6 per cent. Complications were more frequently noted in the cases in which the marrow cavity was exposed. It might be argued that the marrow cavity was opened in the more virulent infections, thus accounting for the higher mortality and greater number of complications, but the cases were not apparently any more severe.

Deaths due to metastatic foci of infection were less common after simple incision and drainage of the periosteal abscess. Suppurative arthritis and foci of metastatic infection were twice as frequent in the cases in which the marrow cavity was exposed and drained. That the sequestrum may be small after incision in spite of the fact that the periosteum has been stripped over a considerable distance is, I believe, the experience of every one. A large sequestrum may form after the marrow cavity has been opened and drained. It is difficult to explain the variations in the size of sequestra in different cases. Some variation may, as previously stated, be due to the size of the artery occluded by the infected or bacterial embolus and the area of bone that becomes dead as a result of infarction and infection may be determined soon after the onset of the disease. The suggestion that the size of the infarcted area depends upon the size of the vessel occluded and not upon the extension of the inflammatory process has received little attention or comment. It is quite probable, however, that this factor plays some role in the sequestration of bone and may explain why the amount of bone which undergoes sequestration varies so much in different cases and with different operations.

In the acute cases in which a subperiosteal abscess has formed, I believe that drainage of the abscess is first indicated. If the fever does not subside and the general condition improve or there is definite evidence of a suppurating process in the marrow the cortical bone should be removed and the marrow cavity drained. Too much emphasis cannot be laid upon the necessity of gentleness in removing this bone in order to prevent the formation of secondary sequestra. Sharp instruments should be employed and the surrounding bone spared as much as possible in order not to kill it by the mechanical measures employed to expose the marrow.

The following cases will be cited to indicate some of the more peculiar types of osteomyelitis.

OSTEOMYELITIS OF THE SPINE

Case I.—H. L., age 40 was admitted to the Presbyterian Hospital on February 3, 1922. On December 11, 1921, he had slipped and in attempting to catch himself twisted his back. He experienced a sharp pain in his back on the left side of the spine in the lumbar region. He continued to work for two days following the injury. On December 13 he consulted a physician. During the afternoon he went to bed. At this time the patient complained of an intense pain in the lumbar region on the left side. He had a high fever and was delirious. On December 15, a swelling was noted in the lumbar region on the left side of the spine, corresponding in position to the second and third lumbar vertebrae. The swelling increased in size and the skin covering it became inflamed. On December 16 the swelling was incised and pus evacuated. The incisions, one made near the spine and one to the outer side of the erector spinae, were still discharging when the patient entered the Hospital.

When the patient was admitted to the Hospital he had a slight temperature. He appeared septic and was emaciated. An x-ray examination made at this time revealed changes which involved the laminae and the pedicles of the second and third lumbar vertebrae on the left side. New bone had formed and the bones were apparently somewhat fused by the process. Distinct sequestrum formation could not be determined by the x-ray examination, but a definite, somewhat irregular shadow could be distinctly seen connecting the second and third lumbar vertebrae. The physical examination revealed no other changes.

An operation was performed on February 4. An incision measuring five inches in length was made to the outer side of the spines of the lumbar vertebrae and denuded bone was found at the site of the lesion revealed by the x-ray. Free drainage was established and further operative interference postponed until the dead bone had been separated.

The patient returned to the Hospital on May 30. After he left the Hospital two abscesses formed. One of these was opened, the other opened spontaneously.

The patient has been up for three weeks. At the present time there is a granulating wound of the left side of the lumbar vertebrae. In the bottom of this wound denuded bone can be felt. The other sinuses have healed. The general condition of the patient is much improved and he has gained weight.

The condition of the vertebrae is revealed by an x-ray picture. An operation was performed

May 31, 1922. The granulating wound to the left of the spine was excised. Roughened bone was felt. This had not been completely separated and was removed by a chisel and rongeur. The patient experienced no reaction at this time and left the Hospital on June 3. The wound healed rapidly. The general condition of the patient has greatly improved. There is some fixation of the spine in the lumbar region, but it is not marked.

In the beginning of the disease this patient, according to his physician's statement, had some symptoms of meningeal irritation. Osteomyelitis of the spine and many of the sarcomas may be followed by extradural abscesses which, extending upward, may cause some meningeal irritation. This possibility should be kept in mind, for in resorting to lumbar puncture for diagnostic purposes in such cases, the needle may be passed through pus situated extradurally and meningitis may develop.

OSTEOMYELITIS OF THE SPINE OF THE SECOND LUMBAR VERTEBRAE

Case II.—W. C., aged 19, entered the hospital August 29, 1922. In June, 1919, this patient suffered from pain and tenderness in the lumbar spine accompanied by fever. At the time the pain developed he had several furuncles and strained his back while scuffling with his brother. He was in bed ten days, during which time he had considerable pain in the back and a marked tender mass over the spine of the third lumbar vertebra. After recovering from this illness the patient returned to college in 1919. He later visited an orthopedic surgeon and was advised to wear a brace. This was worn six months. He was considerably improved, but still experienced some discomfort if he exerted himself or made an extra effort.

About one month after the onset of his trouble a mass developed to the left side of the spine over the point of localized tenderness which the patient formerly complained of. This mass, about the size of a small egg, was situated subcutaneously, was freely movable and not tender. It had some of the characteristics of a lipoma, but was not lobulated and was of somewhat firmer consistency.

An x-ray examination of the spine revealed a peculiar lesion of the spine of the third lumbar vertebra. This spine seemed to be perforated in some five places. The perforations measured from ⅛ to ¼ inch in diameter. It gave the impression that holes had been punched in the spine. The appearance was not like that caused by a myeloma and there were no changes in any of the other bones. Because of the previous history a probable diagnosis of osteomyelitis of the spine of the vertebra was made, but no diagnosis was made of the subcutaneous fat lying just to the left of the median line at the level of this vertebra.

On August 31 a median incision, four inches in length, was made over the second, third and fourth lumbar spines. The subcutaneous mass proved to be connective tissue in which were found several small foci of granulation tissue, but no pus. No connecting tract could be found between this mass and the spine of the third lumbar vertebra.

The spine of the third lumbar vertebra was exposed and foci of granulation tissue surrounded by sclerotic bone were exposed. This spine was removed by bone-cutting forceps and some granulation tissue was removed from a small cavity in the lamina on the left side. The wound was closed without drainage.

The pathological report was as follows:

"Chronic inflammation, with foci in the granulation tissue, in the fascia and subcutaneous fat over the spine of the third lumbar vertebra."

The spine of the vertebra which was removed contained several cup-like formations and within the small cavities measuring a few millimeters in diameter was found a gray gelatinous substance. These cavities also contained granulation tissue.

Cultures made of the granulation tissue in the fat and in the spine yielded a staphylococcus aureus.

A sero-hemorrhagic material was discharged from the wound for a few days. The wound healed, however, rapidly and the patient has apparently recovered from the non-suppurating osteomyelitis of the spine.

OSTEOMYELITIS OF THE FEMUR

Case III.—J. R., aged 37, was admitted to the Presbyterian Hospital November 27, 1922. Five weeks before, the patient experienced pain in the upper part of the right thigh. Some tenderness then developed just below the base of the trochanter. He had some fever at this time, but did not know what degree. He had night sweats from time to time. The pain, which increased in intensity when the patient walked, had been severe. The pain was at the time of admission less than formerly, but was still present.

The general examination was negative. There was some swelling over the outer surface of the right thigh just below the base of the trochanter. The skin over the swelling was reddened and the underlying tissues were indurated. Pressure made at this point elicited exquisite localized tenderness.

An x-ray picture revealed periosteal thickening over the upper end of the right femur and two round cavities of decreased density, apparently bone abscesses. One measured 2½ cm. in length by ½ cm. in width; the other was 1 cm. in diameter. The cortex had apparently been perforated on the inner side just below the lesser trochanter for the periosteum, thickened at this point, seemed to be perforated. No change was noted in the greater trochanter or neck of the femur.

An incision was made over the swelling on the outer side of the femur and a large abscess opened. The dissection was then continued, exposing the roughened outer surface of the femur. When the cortex of the femur was chiseled away, pus escaped and the posterior half of the femur was removed at this point. The abscesses and tissues surrounding them, including several small sequestra, were removed. The wound was closed

without drainage, enough space being left between the stitches to permit of the escape of any products of inflammation. On the eighth day after the operation the temperature reached 100.4 degrees. This was the highest. The patient left the Hospital eleven days after the operation, at which time the wound had practically healed.

OSTEOMYELITIS OF THE WING OF THE ILIUM

Case IV.—C. B., aged 19, was admitted to the hospital August 1, 1921. Five years before this the patient suffered with boils. At this time he developed all the symptoms of acute osteomyelitis involving the left femur. An abscess formed and he had a discharging sinus which led down to a cavity in the popliteal fossa. One week before entering the hospital, after exposure to rain, he noticed pain above the region of the left hip. This pain continued. It was not located just above and in front of the tuber ischii. Pain in about the same location was complained of the preceding year following exposure.

The patient left the hospital on August 3, but returned August 7. At this time an operation was performed. A definite swelling had formed over the outer side of the ilium. This was incised, but no pus was found. Serum was discharged. In the bottom of the wound definite roughened bone was inserted. Abscesses continued to form from time to time. The patient ran a high fever for weeks and finally an abscess which formed upon the inner side of the ilium had to be drained.

An x-ray picture finally revealed a peculiar mottled appearance of the wing of the ilium, foci of necrosis being rather diffusely scattered throughout the cancellous tissue. Finally the diseased portion of the ilium was resected, providing for free drainage of the abscess which had formed on the inner side of the ilium. Marked improvement followed resection of the ilium and the condition of the patient, who had been considerably reduced by a temperature of several weeks' duration, was greatly improved.

OSTEOMYELITIS OF THE HUMERUS—DEAD SUPPURATING MARROW UNACCOMPANIED BY SEQUESTRUM FORMATION OR MUCH CHANGE IN THE PERIOSTEUM

Case V.—J. M., age 30, was admitted to the Presbyterian Hospital November 18, 1920. Some three months before admission the patient complained of pain in the left arm and lower part of the neck. This had not been severe. At one time a diagnosis of cervical and brachial plexus neuritis had been made. The patient's teeth were bad and he had a marked pyorrhea. Several teeth were extracted. Three weeks before entering the Hospital while playing golf he experienced very severe pain in the arm and had chills and a high fever. The pain continued with varying degrees of severity accompanied by some temperature. Three days before entering the Hospital a swelling developed upon the outer side of the arm near the middle. Fluctuation later appeared. An operation performed upon the morning that the patient entered the Hospital showed that the inflammatory process had perforated the humerus near the middle. The cortical bone was removed for some distance and a dead suppurating marrow was exposed. No sequestrum was found. The patient left the Hospital in a week.

On December 2, eight days after leaving the hospital, the patient again became sick with chills, fever and severe pain in the upper part of the humerus. When seen he had high fever and complained of severe pain over the upper part of the humerus. A definite point of localized tenderness was found.

The humerus was exposed and the cortical bone removed. The marrow in the upper part of the humerus was found to be dead and suppurating. This was removed with a sharp spoon. Several small spicules of bone, bone sand, were found in this marrow, but there were no sequestra. The periosteum had not proliferated. The cortical bone showed no marked changes. Healing occurred rapidly without recurrence.

This case is of considerable interest because of the extent and character of the involvement of the marrow accompanied by little, if any, changes in the cortical bone or periosteum.

OSTEOMYELITIS OF THE RIGHT TIBIA—PATIENT SEEN RELATIVELY LATE—LARGE MULTIPLE SEQUESTRA WITH INVOLVEMENT OF KNEE JOINT

Case VI.—H. M., age 11, was admitted to the hospital November 15, 1919, and discharged November 26, 1919.

The patient, four weeks before admission, complained of pain referred to the right knee. His mother noticed nothing abnormal about the knee. During the night the patient was nauseated, had a high fever, severe headache and a severe pain in the knee. The mother noticed that night that the knee was swollen and red. The next day a doctor was called. He made some incisions down to the bone. Pus escaped from these. Three days later several more incisions were made. In spite of these incisions the temperature remained somewhat elevated and the general condition of the patient did not improve. He became very thin. An x-ray examination revealed an osteomyelitis of the upper half of the shaft of the tibia with several small sequestra. On November 18, 1919, an incision was made over the antero-medial surface of the tibia in the upper part for a distance of about six inches. The necrotic marrow with several small sequestra were removed. The wound was closed with interrupted silkworm-gut stitches and a dressing applied.

The boy was brought back to the hospital Dec. 29, 1920. There were several discharging sinuses over the upper half of the leg which led down to diseased bone. An x-ray examination revealed a large sequestrum and several smaller ones. An operation was performed on December 30, 1920. At this operation the tibia, which was considerably thickened, was opened upon the autero-medial surface. A large sequestrum which had been completely separated from the living bone was removed and several smaller sequestra which lay in necrotic and unhealthy granulation tissue.

The skin was then closed with interrupted sutures of silkworm-gut and silk, enough space be-

ing left between the sutures to permit of the escape of any products of inflammation.

The wound healed quickly, as did several of the sinuses. Later an abscess developed in the lower part of the thigh just posterior to the internal condyle. This opened, leaving an abscess which reached down to a small sequestrum on the posterior part of the internal condyle.

The knee was anchylosed in partial flexion with some abduction. This deformity had developed when I first saw the patient and it could not be corrected by manipulations and weight. It should be one of the first thoughts of a doctor dealing with osteomyelitis to prevent these disabling and crippling deformities of joints adjacent to the bone or bones involved.

DISCUSSION

Dr. Isidore Cohn, New Orleans, La.—Osteomyelitis, as Dr. Lewis has said, should be removed from the class of diseases which produce disability. The only way to do this is by early diagnosis. An early diagnosis cannot be made by the x-ray for the very simple reason which Dr. Lewis has called our attention to, that we must have a difference in density of bone if there is to be any evidence on the picture, and this certainly does not show in the early stages, prior to the death of the bone. If osteomyelitis is primarily a medullary phlegmon, an infection which has occurred through the blood stream prior to the time that you have a sequestrum formed, you have only a fat necrosis and increase in the intramedullary tension. This increase gives rise to pain and of course you have the disability, the limp, the high fever, the localized pain and leucocytosis. If on that evidence we make a diagnosis and operate in a radical-conservative way, immediately the temperature will drop, the patient will improve, the pain will cease and the patient will recover quickly. He will never need a second operation.

I want to explain what I mean by "radical conservative" operation. I mean that in most instances I have accepted the idea that the infection is primarily from the blood stream; that the medullary canal is involved before the periosteum, and that the infection goes from within out and not from without in. Believing that to be the fact it has been my practice to open the medullary canal. In doing that we have discarded the use of instruments of a type which will add necessarily to the injury. We must remember that fat embolus is most often the cause of death in cases of fracture, and if that be the case, how much more is the danger of fat embolus being the cause of death if we use chisels, mallets and other types of traumatizing instruments when we have at our command the fine, delicate, motor-driven trephine with which we can make two or three small openings and then connect them with a motor-driven saw. Very little trauma necessarily is given and you can use any after-treatment you wish as long as you drain the abscess. The patient makes a rather rapid recovery and the healing is not, as Walton Martin, of New York, states, fibrous. It is bony every time.

Another point I believe worth while, and that is the question of the use of the curette in these early cases. There is danger in using the curette in scraping off the endosteal cells and thus removing the one thing upon which we are dependent for recovery. You also run the risk of injuring the nutrient vessels and causing the formation of a large sequestrum. The early diagnosis, early treatment and removal of this disease which is producing so many cripples and so many disabilities is of great importance.

SURGICAL RENAL TUBERCULOSIS

By William D. Haggard, M.D., F.A.C.S.,
and
Henry L. Douglass, M.D.,
Nashville, Tenn.

Among our cases of nephrectomy, tuberculosis was the lesion demonstrated in 49 per cent of the specimens. At the Mayo Clinic among 85,000 patients operated upon for all conditions, 0.6 per cent had renal tuberculosis. In 12,688 post mortems held at five of the large hospitals upon those dying from all causes, a tuberculous lesion of the kidney was demonstrated in 4.7 per cent of the total. On the other hand, the autopsies upon frankly tuberculous patients show a kidney lesion in 10 to 26 per cent of the cases. The importance of this subject, then, is at once apparent and it has led us to review our cases, 61 in number, so that we might check up diagnostic procedures and establish more clearly the results accomplished by surgery.

Chronic renal tuberculosis occurs most frequently in the prime of life. The average age in this series was 36 years. The youngest was 18; the oldest, 65. Seventy-three per cent were between 20 and 40, with the largest number in the fourth decade.

Males constituted only 30 per cent of our group. American statistics seem to prove that surgical tuberculosis of the kidney is more common in males. All females were married women with two exceptions. This is unquestionably of importance from an etiological standpoint, for two reasons. In the first place, we found three instances wherein a healthy

wife was infected by a tuberculous mate, the primary infection taking place in the fallopian tube. From this primary focus renal involvement occurred and these patients came to nephrectomy some years later. In the second place, six of the married women began symptoms immediately after childbirth, so that it is very probable that pregnancy and confinement may lower the resistance of a patient with a latent tuberculous focus to the point where the bacillus becomes active enough to involve the kidney.

Case 17.—Advanced tuberculosis with numerous cavities throughout the cortex and a 2-plus dilatation of the pelvis with considerable thickening of its walls.

Heredity played a minor part in our experience. Only three patients admitted that they were born of tuberculous parents. Other evidence corroborating this is the rarity with which this type of renal tuberculosis is found in children.

Renal tuberculosis as met with by the surgeon seldom, if ever, occurs as a primary lesion. It is always merely an extension from the disease in other tissues. Thirty-one per cent of our patients were demonstrated to have foci in other organs. This low figure is probably due to insufficient historical data. Braasch found other evidences of tuberculosis in 71 per cent of their operative cases. His statistics show that the lungs were involved in 28 per cent, the genitals in 73 per cent of the males (rarely in females), the bones and joints in 6 per cent, and the lymph glands in 6.4 per cent. His estimation of pulmonary involvement is based upon x-ray findings. Physical examination will not reveal anything like so high a percentage because the great majority of these cases have no active process; only a cured lesion or one that is dormant. Renal involvement is very seldom seen in connection with an active symptom - producing process either in the lungs or elsewhere. We found the lungs to be the most common focus. Other primary lesions were also demonstrated in the peritoneum, the appendix, the fallopian tubes, the genitals and in the bones.

The blood stream is now considered to be the most important method of invasion. Direct infection is not so frequent as indirect blood stream infection. Tubercle bacilli are often excreted in the urine of tuberculous patients without evidences of renal involvement. When the vitality of the kidney is lowered, these bacilli lodge in the papillae of the kidney and in this way gain a foothold.

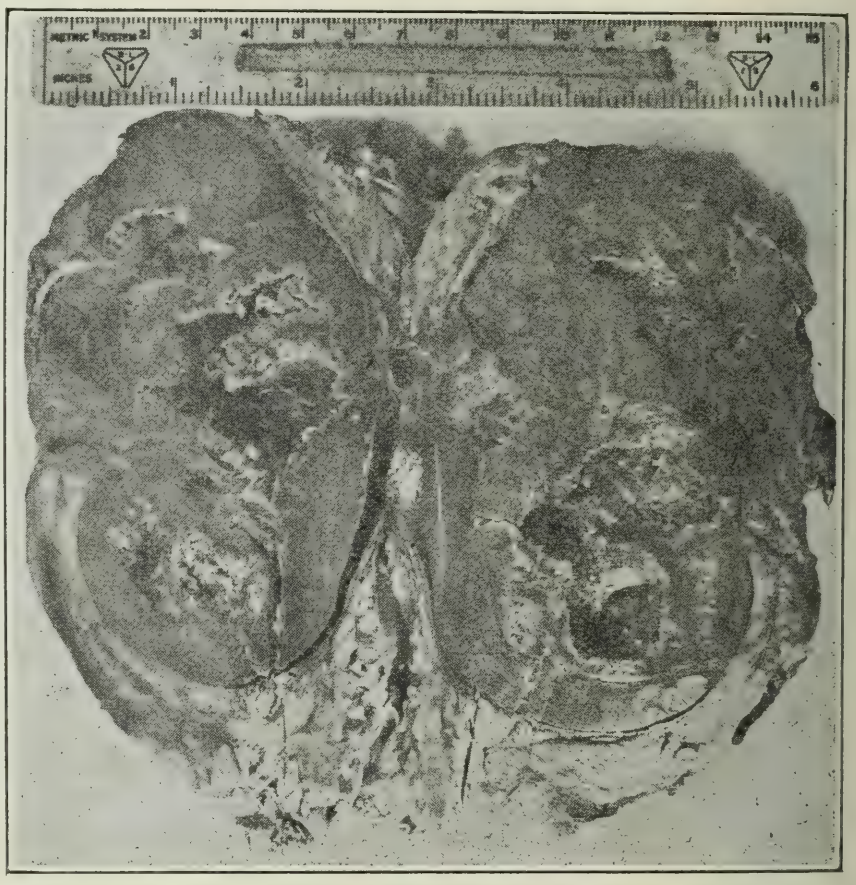
Urinary stasis in the tubules contributes to this method of invasion. Any lesion which hinders free urinary drainage becomes an etiological factor. Deformities of the kidney, especially those which inhibit renal activity, play a part. We have found only one abnormally developed kidney in this series. It consisted of a bifurcated ureter and a kidney with a double pelvis. In one other case a stone was found in a tuberculous kidney which we believe was the result rather than the cause of the infection. The consensus of opinion is decidedly unfavorable toward the views which have for-

merly been advanced concerning invasion through the lumen of the ureter. We have never encountered a primary tuberculosis of the bladder and there is good reason to believe that it never extends upward, except possibly through the lymphatics.

Wegelin and Wildbolz demonstrated that tubercle bacillus practically always attack the papillae first. Subepithelial tubercle develop primarily on the lateral surfaces of the pyramids and in the niches of the calyces. From these primary tubercles the disease extends by way of the blood, the lymph and the urinary passages. They were found to occur frequently along the arterioles, like a string of pearls without involvement of the vessel wall. For this reason, they concluded that the lymph channels are the most common avenues of expansion. By extension it involves usually a wedge-shaped area of the cortex over the infected pyramid.

According to other investigators, the most common situations for the tubercle first to develop are the glomeruli nearest the pyramids. The pelvis and ureter are subsequently infected in all cases. The ureter becomes thickened, rigid from induration, so that its power of contractility is lost and it remains patent like a pipe stem. Wherever tubercles develop, round cell infiltration and fibrous tissue occur about them in proportion to the resistance of the patient. Consequently various contractions from scar tissue producing stricture and deformities of the ureter are common. Caseation occurs in the substance of the kidney and in the favorable cases the process becomes walled off by dense fibrous tissue.

A deposition of calcium is often found in and about these tubercles. This is the nearest that Nature comes to effecting a cure. Sometimes a large cavity in the cortex of the kidney becomes walled in, and this for the time relieves more or less completely the patient's symptoms. Later on this wall gives way and a recurrence of frequency, pain and strangury quickly develops. It is not uncommon for the ureter to become strictured to such a degree that the kidney is completely isolated. This occurs in about 10 per cent of cases according to Braasch and takes place gradually rather than suddenly. In such cases the symptoms are partially or completely relieved, although the kidney goes on to complete destruction. It has been spoken of as auto-nephrectomy. These kidneys are occasionally found to be simply calcified caseous masses so that, although Nature may relieve the dramatic syndrome of tuberculous cystitis, she never effects a complete cure.



Case 41.—A kidney showing an enormous cavity communicating with the pelvis through a very small opening. There are also caseating areas and a large amount of fibrosis throughout the cortex.

The healthy kidney is often the seat of a toxic nephritis. Albumin and casts may be demonstrated in the urine from the opposite side. The opposite kidney is seldom, if ever, involved in the disease at first. As the process advances, the likelihood of bilateral infection increases. By the time the case reaches the surgeon the

percentage of bilateral involvement is variously estimated at from 10 to 29 per cent of the cases. In our series 10 per cent were demonstrated to be bilateral.

The clinical symptoms produced by renal tuberculosis are as characteristic of the disease as those produced by any other pathological process and the clinical history is of more diagnostic importance here than in gastric ulcer because it is not nearly so often mimicked by the neurotic. The initial symptom in 90 per cent of our cases was frequency. Its onset was gradual as a rule and it was first apparent by day. It was chronic; it did not get better, but on the contrary insidiously grew worse. Its progress was rarely marked by remission. At first the frequency is due to a polyuria because in the earlier stages the tuberculous irritation stimulates the kidney to greater activity.

Very soon, however, the frequent desire is the consequence of vesical irritability and inflammation. When this occurs, pain becomes associated with frequency. Pain in the bladder and urethra on urination is usually an early symptom and often appears simultaneously with frequency. In 80 per cent of our patients pain occurred at or about the time the frequency developed. Ten per cent complained of no pain during the entire course of the disease. Pain of some character, however, appeared in 90 per cent at an earlier or later stage. It was usually described as a burning in the urethra and neck of the bladder during and after urination or a sharp pain in the bladder on voiding, sometimes a dull aching in the bladder and perineum.

One of the typical features of the disease is the chronic progressive course of these two symptoms. Only 4 out of 61 patients stated that they had enjoyed intervals in which the symptoms had subsided and in these 4 the relief was not complete.

Blood in the urine occurred in 55 per cent of the total. There was no case in which the hemorrhage was severe. Only 3 patients passed small clots and suffered with renal colic. All the patients who had hematuria had passed bloody urine on several occasions. At times a few drops of blood come at the end of urination due to urgency and straining. Severe renal hematuria is rarely seen.

It is remarkable how infrequently the history brings out symptoms referable to the infected kidney, viz: renal colic, due to the passage of blood clots, a mass in the renal area, vague, indefinite pain in the lumbar region and soreness over the kidney involved. In 6 cases wherein the patient complained of symptoms pointing to the kidney, the pain was referred to the healthy side. Such cases are apt to be very misleading.

Even in the last stages the clinical picture remains confined to the bladder. The suffering amounts to agony. These patients have to void every few minutes. In some of our cases it was equivalent to incontinence. These patients had to sleep with a urinal. This severe pain on urination and the strangury that follows is almost unbearable. The frequency and urgency demands that this torture be repeated every ten or fifteen minutes until they die a lingering death of suffering and exhaustion.

The clinical data in this series was:

1. Increased frequency of urination, 90 per cent.
2. Pain. Initial symptoms, 80 per cent. At some time during the disease, 90 per cent.
3. Chronicity without remissions, 91 per cent.
4. Hematuria, 55 per cent.
5. Pyuria or cloudy urine, 95 per cent.
6. Urgency of urination, 90 per cent.
7. Strangury, 90 per cent.

These patients ran unusually long courses before consulting a surgeon. The average duration of symptoms was 3 years and 9 months. There are two explanations for this. First, the disease is of such a gradual and insidious nature that the patients failed to consult their physicians earlier. Secondly, renal tuberculosis is not recognized frequently until late in its course. Too often it is not thought of because the classical symptoms of fever, night sweats, etc., are lacking. The kidney is regarded as innocent or not thought of at all because of the entire absence of renal symptoms. Only 15 patients stated

that they had lost any weight. The loss varied from 10 to 40 pounds.

It must be realized, then, that these patients may be quite well except for their local distress. For this reason the real nature of the disease escapes detection. In elderly males it masquerades under the diagnosis of hypertrophied prostate. In women as a cystitis. We have been called to distant hospitals to operate on these cases for stone in the bladder. We have seen other cases that had been erroneously operated upon for stone in the bladder, or for cystitis with a resulting fistula that never closed. Other cases are diagnosed as merely cystitis and pyelitis. In the later stages they are sometimes sent in for perinephritic abscess. Tuberculosis is undoubtedly a frequent cause of perinephritic abscess in advanced cases, but there is usually a previous history which will reveal the underlying infection. We cannot emphasize too strongly that the symptoms of chronic, progressive cystitis in the middle aged are more often due to renal tuberculosis than to any other single cause.

The diagnosis in the great majority of cases is not difficult. Physical examination will usually reveal a tuberculous focus in other portions of the body. The tuberculous kidney is enlarged in the great majority of cases. Altogether nearly 30 per cent of our series were recorded as having palpable kidneys. Emphasis has been laid upon palpation of the lower ureters by means of pelvic examination. Kelly states that he has been able to feel a hard, thickened and enlarged ureter on the infected side in 70 per cent of his cases.

The next examination of importance is the urine. In the female it should always be a catheterized specimen. This will eliminate extraneous pus and smegma bacilli. The urine in these cases is pale, of low specific gravity, acid in reaction, and contains pus, blood and tubercle bacilli. Albuminuria is said to precede pyuria. Finding the tubercle bacilli associated with pus in the urine assures the diagnosis. Since bacilli are excreted in the urine of tuberculous patients without renal involvement, the finding of bacilli in urine without pus is not convincing.

The bacillus was first found in the urine by Babes in 1883, one year after the microorganism was discovered by Koch. It is not as a rule difficult to find them. Among the last 21 kidneys which were removed at St. Thomas Hospital and proved to be tuberculous, the bacillus was found in the urine in 65 per cent of these patients. In this series the percentage of positive findings was practically the same. The number of examinations required to demonstrate the bacillus varied from 1 to 14.

Guinea pig inoculations were not resorted to regularly because of the time required to complete the test, usually six weeks. A diagnosis can be arrived at in other ways without such a delay. We have used inoculations in cases of chronic cystitis not included in this series, the cause of which was doubtful and in which repeated examinations of the urine failed to demonstrate the bacillus. We have never had a positive guinea pig reaction in any case in which we had failed to make a diagnosis by other means. Although we consider it a very accurate procedure, we have not found it essential.

A purulent urine which is negative on culture or a purulent urine which, when stained, shows no bacteria, is indicative of tuberculosis. On the other hand, renal tuberculosis may and often does occur with purulent urine loaded with other types of bacteria.

Cystoscopic examinations in a large number of cases are sufficient in themselves to establish the diagnosis. Practically every case comes with tuberculosis of the bladder. This involvement varies from a slight and localized inflammation to an intense and diffuse reaction with marked destruction of mucosa, vesical contraction, scarring and deformity. Some bladders seem to be more immune to the infection than others. I have seen long-standing cases with marked kidney destruction and with only a slight reaction in the bladder. On the contrary, in some of the most intense cases of cystitis the kidney is found at operation to be slightly infected.

The infection may be limited to one pole. Kondeck, in 1899, demonstrated

that in many cases the lower pole of the kidney received an arterial supply direct from the aorta. This may help in localizing the infection of the lower pole.

A point of importance is that the inflammation radiates from the ureteral meatus of the side involved. This was true in our series with three exceptions. In these cases there was no evidence of cystitis. In 4 other patients the inflammation around the meatus of the infected side was very slight. All other cases showed definite and characteristic bladder lesions. In 6 patients both ureteral meati seemed involved. In these cases 1 meatus was highly inflamed, while the opposite one was slightly infected. Examinations of the kidneys in bilateral involvement shows the same pathological relationship. In one kidney the process is found to be advanced and old. In the other kidney, the lesion is recent. Rovsing called attention to the fact that the bladder involvement sometimes occurs around the meatus of the healthy kidney, but we have never observed such a case.

The left kidney was found to be involved in 42 per cent and the right kidney in 58 per cent. Six patients had undoubtedly mild and less ancient infection in the opposite side, making the number of cases subsequently becoming bilateral 10 per cent.

The bladder lesions themselves are not only characteristic from the location, but from their appearance as well. The ureteral meatus of the infected side is inflamed, may be retracted due to an extravesical shortening of the ureter, and rigid from induration. It, therefore, cannot contract, but remains gaping, the so-called golf hole meatus. Its diameter is increased in many instances because of ulceration, which leaves a mouth with a ragged outline. Around this meatus covering a greater or lesser area are the tubercles, ulcers, tissue that is granulated and tissue that is hyperemic. This tissue bleeds easily. Frequently the ureteral meatus is hidden by inflammatory reaction and the intravenous injection of indigo carmin is necessary in order to locate it. Blue spurts will help to reveal its mouth. The degree of color will give some idea of the renal function. In some cases the effected ureter cannot be catheterized by any and all means.

The condition of the presumably sound kidney is of as much importance as the diseased one from a surgical standpoint. We do not, therefore, agree with those who deem it unsafe and unnecessary to catheterize the healthy side. It has been our routine to catheterize both sides when possible, and thereby determine the presence or absence of pus in the opposite side as well as doing a differential function. It is rather a common experience to find the function of the healthy kidney above normal, which is the result of a compensatory or work hypertrophy in cases of severe unilateral tuberculosis. The function of the diseased kidney has varied from practically normal to zero in our experience. We have not had a normal function in a tuberculous kidney. In several instances, however, the function was so nearly normal that they were of no diagnostic value without other findings taken into consideration.

The x-ray has given us valuable information. A clear picture will outline the kidney and the size of the two can be compared. Occasionally a plate will demonstrate a shadow in the kidney outline. These shadows are due to a deposition of calcium about an old caseous tubercle. The outline of such shadows are hazy, irregular and indefinite. They can be differentiated from the clear-cut shadow cast by a stone. These shadows are very indicative of renal tuberculosis. Occasionally the entire kidney is calcified.

Pyelography in tuberculosis of the kidney is of little practical importance and is seldom employed. The information we gain from it is of academic interest rather than practical importance. More useful knowledge is gained in x-raying the chest, and this has been usually carried out.

The surgical treatment of renal tuberculosis began in the latter part of the past century. Thirty-eight years ago Gross could only find in the literature 20 operated cases. There was a mortality (primary) of 40 per cent. Many surgeons in the earlier years were doubtful whether surgery should be employed in these cases because of such fatal results. At the pres-

ent time the surgical mortality has been reduced to a little over 1 per cent. We were fortunate in not losing a single case in the hospital. One patient, however, died the same day he reached home.

The late results are not so favorable. Thirty-three and one-third per cent of our patients died in the first five years after operation. Twenty-two per cent died within a year of the operation. This leaves 11 1/3 per cent who died from one to four years after leaving the hospital. All deaths were attributed to the tuberculosis, although there were some who undoubtedly died of other causes. If the resistance of the patient is sufficient to carry him through the first year his chances of permanent cure come up to 88 2/3 per cent.

In 20 per cent of the cases tuberculous sinuses formed in the wound. One of these cases apparently had a urinary fistula through the ureter. This case healed without treatment in three months. All others had from 1 to 2 x-ray exposures over the wound and in no case did the sinuses drain longer than 3½ months.

Among the cases that survived the operation from 2 to 3 years, 33 per cent are well and 67 per cent still complain of some cystitis, although the symptoms are greatly improved. Of those surviving 3 to 5 years, 60 per cent have no frequency and in 40 per cent mild symptoms of cystitis persist. In no case has the cystitis been treated following operation.

At the Mayo Clinic Braasch reports a surgical mortality of 1.3 per cent. The late mortality was 24.1 per cent. Over half of these died within the first year. There was complete cure in 60 per cent and recovery in 80 per cent.

If not operated upon, we can expect only 20 per cent of these cases to live longer than 5 years, according to the end results of 316 unoperated cases presented by Wildbolz to the German Urological Society.

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DIAGNOSIS OF STONE IN THE URETER*

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The positive diagnosis of stone in the ureter is at times, in spite of the many means which the surgeon has at hand, most elusive and unsatisfactory. There are many of us in this room who have removed the appendix, or performed some other abdominal operation, only to find in course of time a return of the pain with all the subjective symptoms from which the patient formerly suffered. Again, there have been occasions when the surgeon has been confident that a stone in the ureter was present, but despite a thorough investigation a positive opinion could not be made.

The time limit of this paper is such that no attempt will be made to take up the etiology of stones, their presence in the substance, or in the pelvis of the kidney, or the treatment of this condition. We shall limit our remarks to the diagnostic measures which we possess for confirmation of stone in the ureter proper. For we have presupposed that the patient's history, the urinalysis, blood count, renal efficiency test, x-ray and even cystoscopy and ureteral catheterization have led us to the provisional diagnosis of ureteral calculus, and our idea now is to confirm this opinion definitely or see to it that some other conclusion is arrived at that negates the presence of stone.

It is desirable at this time to review hurriedly the anatomical position of the ureter. On both the right and left side the ureter lies upon the psoas muscle, runs vertically downward, parallel to and just tangent to or one centimeter or so

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external to the tips of the transverse processes of the lumbar vertebrae. In many normal instances the leaded catheter shows coursing internal to the ends of the transverse processes. On the right side the ureter is crossed by the branches of the mesenteric artery which are distributed to the ascending colon, and on the left by the mesenteric arteries directed to the descending colon. Just anterior to the sacroiliac synchrondrosis the ureter crosses the common iliac artery and vein, lying behind the sigmoid flexure on the left, the most lateral deviation of the ureter being where it crosses the obliterated hypogastric artery internal to the ischial spine. It is the opinion of the writer that the normal ureter does not course just in front of the ischial spine as is represented in some text books, but is one or more centimeters toward the medial plane. At this point it now follows roughly the contour of the bony pelvis, curving backward, and due to the interposition of the uterus in the female, the distance between these two tubes just before entering the bladder is greater than obtains normally in the male. Otherwise their anatomical relationship is the same.

The following shadows and pathological states are some of the more usual that have to be reckoned with and differentiated from stone in the ureter.

Prostatic Calculi.—Single or multiple calculi in the posterior vesical margin of the prostatic gland may simulate ureteral stones. These stones are necessarily placed low, are usually multiple, faceted and if rayed vertically will be found anterior to the ureteral opening. Further substantiation of their presence may be definitely gained with the cystoscope and by ureteral catheterization.

Small circumscribed seminal vesicular abscesses or calculi might likewise be confounded with stones in the ureter. A thorough rectal investigation is indispensable. The retropubic location and exquisite pain brought out by examination should recognize this condition.

Diverticulae of the bladder are notoriously fond of catching urinary crystals, which sooner or later are formed into stones. Unless these are mesially placed it does not appear that they should be confounded with stones in the lower segment of the ureter.

Ureteral diverticulae holding a stone, as has been shown by the writer in a former case, may likewise be confusing, as would be a double ureter, the stone being impacted in one of the tubes, the other being negative. The double opening in the bladder and catheterization of both ureters should differentiate the location of the shadow, particularly when supplemented by stereoscopic examination.

Encrustations on a vesical papilloma, particularly in the vault of the bladder and mesially placed, may be misleading. Cystoscopic examination should readily detect this error.

Stone in the Bladder.—It would appear that this condition should not be a source of error with ureteral calculi. The writer, however, had a case of stone in the bladder, the x-ray of which was evident and showed singly. By suprapubic operation this stone was removed, but was overlying a large stone impacted in the ureter at its mouth. An incision longitudinally through the ureteral os removed this stone also with very happy results.

Atheromatous arterial patches of the internal iliac and other arteries may throw shadows which at times may be deceiving. Their irregular outline, their indefinite shape and flattened surfaces, a general atheroma, and evident arteriosclerosis should be of sufficient diagnostic strength to prevent confusion.

Foreign bodies in the intestinal tract may at all times be confounded with stone in the ureter, particularly when they follow a barium meal. The expert radiographer and a thorough fluoroscopic investigation should reveal the character of this trouble.

Sesamoid Bone in the Tendon of the Obturator Internus.—This small, round, hard shadow may lie just tangent to the ureteral catheter and it is particularly indicated in these instances that a stereoscopic examination is to be carried out.

X-ray parallel to muscular fibers or tendons, or muscular abutment, can only occur when there is some anomaly of the structures about the pelvis, as the radio-

gram taken here is at a vertical axis and not parallel with the muscle fibers in this region.

Peristaltic Convolutions.—As has been mentioned by some authorities, there may be a stone in the ureter which is hidden by the union of these concentric curves, and again a re-enforcement of the shadow at this point of union may simulate a stone. The fluoroscope in this instance is of particular value, as the intestines may be dislodged by the hand and the obscuring shadow thrown by the intestines shoved to one side.

Osteophytes, exostoses and bony spurs may spring from the transverse processes of the spine or the pelvis in the line of the ureter and thus be confusing. The leaded catheter is of particular value here.

Calcified glands are frequently present, sometimes singly and, in other cases, numerous glands are seen. As a rule, it is easy to distinguish between calcified glands and renal calculi. Cabot has found that the best method of differentiating these shadows from calculi was to take separate plates, one in forced inspiration and the other in forced expiration. This method of differentiation would be particularly applicable to stones impacted in the upper ureter. Usually it will be seen that the shadow does not bear the same relation to the ureter in the two plates. This method would not appear to be of any diagnostic worth when the stone is at or below the pelvic brim. Stereoscopic plates are, however, of value in such cases. Turning the patient on the side or on the abdomen for further plates should so dislodge the intestines that the shadow would not be constant in its location.

Pigmented Moles.—Pigmented moles on the back of the patient or on the abdomen, which sometimes lie in the course of the ureter, may be mistaken for calculi. Here, again, stereoscopic plates would be of greatest value, or if a wire ring is put around the mole and a piece of adhesive plaster fastened over the ring on the skin, it will be seen that the shadow changes position when the adhesive strap is pulled to one side, and thus its relation to the transverse process of the lumbar vertebrae may be changed considerably.

Concretion in the Appendix.—These are rare, but may be mistaken for ureteral calculi, particularly if the patient is rayed following a bismuth meal.

Intestinal Shadows.—Intestinal shadows, as a rule, can be readily recognized, but not infrequently small masses of bismuth, following a bismuth meal, may lie in the course of the ureter. As a rule, however, these shadows are of such a nature that this need not be considered a serious source of error. Calomel tablets, or other pills or tablets containing heavy metal salts, may give rise to mistakes.

Gall Stones.—It is questionable if this condition could justifiably be confounded with ureteral calculi.

Concretions in the navel, particularly in the pendulous belly, may at least be mentioned.

Phleboliths and arterioliths which are so frequently found in the large veins of the pelvis, and ofttimes lie right in the course of the ureter, give rise to more difficulty of positive diagnosis from ureteral calculi than any other one factor. Although these phleboliths may occur in any one of the veins of the abdominal cavity, it is particularly in the bony pelvis and about the prostate and hemorrhoidal plexus that this concretion is peculiarly located. The prostatic and hemorrhoidal veins are spacious, large, usually free from valves, and undergo a physiological enforced congestion and depletion. A bacterial contamination from the rectum is ever imminent, so that with advancing years, the slowing of the blood current in the pelvis, the greater increased back-pressure from prostatic block and costive bowels, the pathology of stagnation, arrest, clotting, solidification and deposit of salts is in regular order and uniformly obtains to a greater or less degree. The writer on many occasions has noticed in the suprapubic enucleation of the prostate, when the finger has been inserted between the capsule proper of the prostate and the sheath formed by the rectovesical fascia, which is exactly in the line of flow of the plexus of Santorini, that the torn periprostatic veins allow of an escape of many phleboliths so that one feels a bed or nest of little, hard, round, firm stones which may be likened to shot from the

smallest bird shot to B.B.'s. These are phleboliths which, lying in the peri-prostatic envelope, were liberated on the removal of the gland. And the writer believes that 95 per cent of the confusing shadows, regardless of the size, found in the bony pelvis are due to calcified blood clots which, according to the angle of incidence of the rays, are round, oval or elongated.

But the mere presence of an unsuspected shadow along the anatomical course of the ureter which requires investigation for absolute differentiation is not the only trouble which confronts the surgeon. In those cases in which we feel relatively certain of the presence of a stone in the ureter and repeated x-ray examinations are negative, a condition arises which indeed taxes our ingenuity. It must be recalled here that stones formed by oxalate of lime throw the densest shadow, urates and phosphates are next in order, and the uric acid stone, which fortunately constitutes a small percentage of all stones, throws a very dim shadow, or what is more likely on account of its consistency, no shadow whatever. It is just with this stone that the writer believes the source of most of the trouble lies, and we must resort to every known device and means to assure ourselves of its presence or absence. We recall one case that had been rayed seven times by the same operator. On each occasion the report came back negative, but finally this calculus was located and removed. It may be that the future holds some means of measuring x-ray penetration, so that objects of varying density, specific gravity or consistency, will have an exposure accordingly, this exposure being adjusted particularly and accurately to the supposed specific gravity or density of the medium to be examined. All of us who see plates are constantly struck with the difference in their clearness of detail. One plate taken by an operator on the same machine, with the same fractional exposure, may be excellent, and the next skiagraph, under the same mechanical conditions, so indefinite in its detail that repeated raying may be necessary to obtain a satisfactory result.

The following mechanical measures are the armamentaria we possess at the present time for diagnosis:

Cystoscopy.—The writer has called attention in years past to what was considered to be a pathognomonic appearance of the ureteral crater in stone impaction of the lower ureter, describing it as a bulging, snout-like, whitish, transparent edema of the ureteral and vesical mucosa, just at the opening of the tube, and for years this was considered to be diagnostic, the small venous radicles being so blocked and suffused by the pressure of the stone that the resulting edema would show itself in the mucous membrane of the ureter at its junction with the bladder. Only recently a case of stone in the lower ureter gave exactly the opposite pathological picture. The ureteral os was round, hard, open, the mucosa of the crater dark gray, something like the golf hole ureter of Hurry Fenwick, so that our belief now is that there is no pathognomonic appearance of the ureteral os which is invariably associated with stone in the lower segment of this tube.

Catheterization of the Ureter.—This is one of the most reliable and satisfactory means we have for a positive diagnosis. Those of us who have had the opportunity to do some of this work appreciate pretty accurately the resistance offered in the normal ureter to a No. 5 or 6 French ureteral catheter as it is introduced upward towards the kidney. We likewise appreciate the curves of the ureter and know full well that the first 3-5 centimeters is the most resistant and difficult part of the tube to catheterize. This is not due to the restricted lumen, but to straightening out the most curved part of the tube, getting it in alignment. We likewise appreciate the sensation of running into a stricture, kink or extra-ureteral embarrassment of the ureter, which does not allow of further ureteral intromission. This resistance, we believe, can be sharply differentiated from the abrupt, firm, painful arrest of the catheter due to stone. A small copper or steel wire may be threaded through a flute-pointed catheter and so shoved on up to the stone. The grating, scratchy sound may be pretty clearly elicited as the wire

is incorporated throughout its length and well insulated by the catheter. On one occasion at least the writer had the good fortune to detect a stone which would not yield to other diagnostic means.

The Ureteral Telephone.—This is practically the same method or principle, the steel wire having ear cups or glass bells which are supposed thus to detect and transmit the metallic sound. The writer's success with this diagnostic means has not been very encouraging.

Ureteral metallic olivary sounds inserted through the cystoscope into the ureter, the cystoscope then removed and the flexible sound introduced up the ureter to the obstruction is one of the best and most reliable methods we have at hand. The conical point minimizes trauma and its size should detect a stone which otherwise might be turned aside.

Wax Tipped Catheters and Bougies.—A plain ureteral catheter may be dipped in melted paraffin and carefully put in the cystoscope and inserted in the ureteral os and introduced as far as the obstruction. It is then removed and the end examined under magnification for evidence of roughness or serrations. This is one of the established means of locating stones.

Sodium Bromid.—A 25 per cent solution may be injected through the catheter as its point rests against the obstruction and an x-ray may be immediately taken. If it is a stone this coating may be just sufficient to throw a satisfactory shadow. In a case recently of a stone impacted at the pelvic brim six pictures were negative. The seventh one, the stone having been sprinkled with sodium bromid, showed a very distinct shadow which was removed by operation. This method of spraying the suspected stone with a shadow throwing solution is not to be confounded with

Ureterograms, which are designed to show the calibration of the tube. Many different solutions have been used, thorium, silver salts, and more recently a 20 or 25 per cent solution of sodium bromid has been uniformly employed. This procedure should be carried out under the fluoroscope, as the rate and direction of the flow of the fluid can be noted along the ureter, and the degree of distension of the tube likewise shows up. If the filling up of the ureter beyond the point of apparent obstruction is slow, we should rather anticipate stricture or extramural encroachment. On the other hand, a more rapid flow would signify that the stone had been rolled aside and this allowed a more rapid filling up of the ureter. This fluoroscopic picture should be supplemented at its different stages by x-ray plates. The writer does not know that the ureterogram differs greatly in its appearance whether the obstruction has been due to stone or to stricture. Theoretically the ureter should be more uniformly dilated and to a greater degree with stricture, which is congenital. Stone, on the contrary, being recently acquired and movable, could not have produced so great a degree of distension of the ureter as is seen in stricture. This ureteroscopic examination with the fluoroscope is a most valuable adjunct to diagnosis. The writer would like to state that in his personal experience ureterograms with stones are most unsatisfactory in the lower part of the ureter, the fluid returning alongside of the catheter and not gaining the segment of the tube proximal to the stone.

In conclusion, the mechanical means of diagnosis of stone in the ureter have been more progressively developed than many other surgical problems that confront the surgeon, and with a careful and repeated investigation the writer believes that relatively few stones in the ureter will escape detection.

A COMBINATION SOUND AND DEEP INSTILLATOR

By Andrew G. Cowles, M.D., F.A.C.S.,
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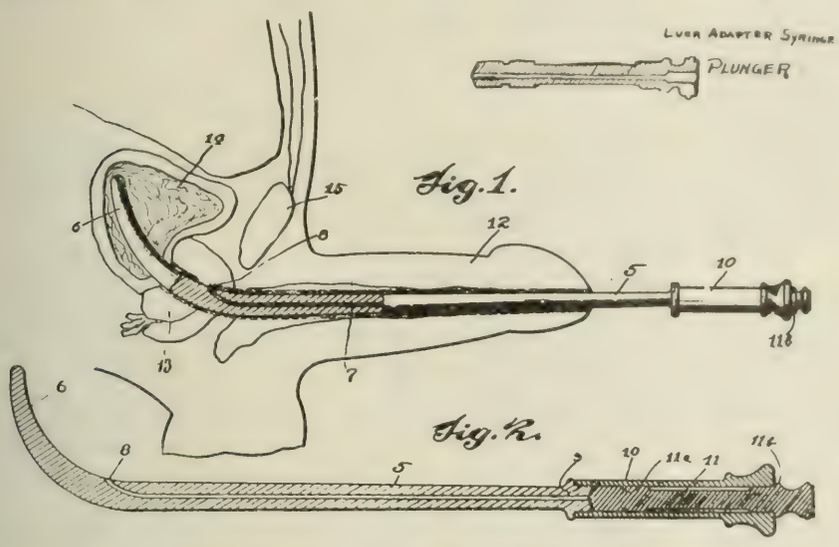
The many and unsatisfactory methods of treatment of chronic posterior urethritis and prostatitis, the recurrences from time to time of cases apparently cured, even after repeated urethral and prostatic smears, have led the author to try out several ideas which seem to be improvements, principal of which is a new instrument which is here termed a combination sound and deep instillator.

It has, heretofore, been the practice in the treatment of disorders of the urethra, bladder and adjacent periurethral ducts to employ two instruments, one of which is to explore or dilate strictures of the urethra, the bladder for stone, but principally to iron out the folds and stretch the urethra, while the other instrument employed is an instillator whereby medicant for the treatment of disorders may be injected to the diseased parts. The use of the two instruments



above referred to, necessitating, as it does, the separate insertion of both instruments, results in considerable trauma and pain, especially in the case of the instillator. It is, therefore, the primary object to provide a combined instrument, which will serve the purpose of both the instillator and the sound.

The features of construction and arrangement of the various parts will be fully described in detail, and, in order that it may be better understood, reference is made to the accompanying drawing.

The instrument is shown inserted within the urethral passage of the penis and extending through the prostate (13) into the bladder (14).

The proper instrument is selected, 30, 28 or 26 F. or 20, 18, 16 A., and sterilized. Prior to use, the instrument is inserted into a container of medicant, whereupon the plunger (11) is drawn back and the cylinder (10) filled with medicant. Lubricating with one of the usual lubricants, the instrument is gently inserted into the urethra and allowed to remain for five minutes, or more, during which time it serves to "smooth and iron" out the folds. The sound end (6) may be used to locate the strictures of the urethra and also assist the operator in properly locating the instrument to treat the diseased part. After the instrument has remained in position a sufficient length of time the medicant within the syringe (10) is slowly injected through the tube (5) and out through the opening of the duct (9) to spread throughout the tissues to reach every part of the urethral canal and the mouths of the periurethral ducts. The urethra with the vesical sphincter contracting around the instrument attains a thorough film or coat throughout the entire length from the sphincter to the meatus, which can be retained for an indefinite period by gentle pressure at the meatus. It will also be apparent that by inserting the instrument deeper until the opening (8) is within the bladder and removing the plunger (11) the bladder may be catheterized. Then inserting a Luer adapter plunger into the instrument, replacing an ordinary plunger, with a 20 to 50 c. c. Luer syringe an intravesical instillation can be made.

DESCRIPTION

It is composed of three instruments in a case, each with combination plunger and a Luer connection or adapter. The case is made of Duraluminum; top and bottom solid and unlined, with nested compartments to fit each part or instrument. The instruments are in three sizes, 30, 28, 26 F., or 20, 18, 16 A. The caliber is as per drawing. It is made of non-corrosive monel or stellite metal. The plunger and adapter are as illustrated.

Experiments have shown that with one of the analine dyes, acriflavine, mercurochrome, or mercurophen and neo-silvol, etc., held in contact with the dilated urethra, penetration will take place through the mucosa and the submucosa and along the periurethral ducts. The average duration of gonorrhea under this treatment is distinctly less than with the usual methods.

There is less pain and discomfort to the patient and less trauma from instrumentation. So far as the author knows, it is the only instrument that will keep the urethra dilated and hold the medicinal agent in contact with the mucosa for an indefinite period of time.

PREGNANCY FOLLOWING DOUBLE LIGATION OF BOTH FALLOPIAN TUBES: SECOND CESAREAN SECTION*

By H. A. Davidson, M.D.,
Louisville, Ky.

Mrs. M. S., a young married woman, aged 20 years, white, pregnant, a primipara, came to my office to arrange for her delivery at the time due, about June 28, 1920. She gave a history of a normal pregnancy, was never nauseated, had no constipation, no headache, and the urine analysis was negative. She was active in habits and doing her own housework. The past history was negative except for a tuberculous hip joint that became noticeable when she was four years old. This was treated at the Children's Free Hospital

*Presented in Case Report Session, Section on Obstetrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

for two years, and the patient was a cripple and invalid until 10 years of age. Since then she had been active, although she walked with a limp. The lame leg was three inches shorter than the other and was adducted.

Pelvic examination revealed a contracted and asymmetrical pelvis. The pelvic measurements were: Sp. 21, Cr. 26; Tr. 28.5, Cd. 9.5.

It was decided to deliver the patient by cesarean section, and she was admitted to Norton Infirmary at the estimated time, June 28, 1920. Operation was done July 1, and a living female child, seven pounds, was delivered. After closing the uterus with three layers of catgut suture both tubes were ligated with Pagenstecher thread. Each tube was tied twice, and the ligatures were one inch apart (four ligatures in all). The patient made an uneventful recovery. Mother and baby were discharged "cured" 21 days after the operation.

About twenty months later the patient again presented herself, pregnant, the estimated full term to be due July 1, 1922. Two days earlier, June 29, was elected as the time of operation, and a living male child, weight seven pounds, ten and one-half ounces, was delivered by section. Following delivery and closing of the uterus both tubes were resected at the cornua of the uterus.

The gross findings and method of operation are copied from operative record number 1073-1922, Norton Infirmary, Louisville.

Findings: The uterine scar of the section made two years before was difficult to find and perfectly solid, not thinned out. The old scars in the tubes (two in each tube, one inch apart) were evident. Remains of the old ligatures were present. Scars and fine ends of linen thread showed where the tubes had been tied with Pagenstecher thread at the operation two years previously. No adhesions were found except slight adhesions of the broad ligament.

Method: Incision was made to the left of the median line of the abdomen from two inches above the umbilicus to a point three inches below in the scar of a previous cesarean section (July 1, 1920). Just as the incision was made in the uterus an ampoule of obstetrical pituitrin was given by hypodermic, and one ampoule of ergot was given by hypodermic five minutes later.

The placenta was attached to the anterior wall of the uterus. The incision penetrated it. The membrane was ruptured, feet grasped and baby delivered. Placenta and membrane were delivered and the inside of the uterus was wiped out with a hot sponge. The uterus was closed in two layers with twenty-day chromic gut No. 1, the first layer through muscle, the second layer through muscle and peritoneum. A wedge-shaped section of the uterine end of each tube was removed from the cornua of the uterus, and the proximal end of the tube was buried in the broad ligaments. The abdomen was closed in three tiers with plain catgut in the peritoneum and skin. Twenty-day chromic gut No. 2 was used for fascia.

The clinical record of this case is interesting in connection with the circumstances of its being the second cesarean delivery in exactly two years with no ante partum medication or manipulation and the elective date for operation.

Following the first operation the patient was informed that there would be a possibility of future pregnancy, since the tubes were only tied. Following the second operation the patient was informed that there could be no subsequent pregnancy because of the special operation performed.

This case is interesting because it proves that simple tying of the tubes even in two places on both sides with non-absorbable sutures will not prevent future pregnancy.

DISCUSSION

Dr. Robert M. Anderson, Shawnee, Okla.—Is it not better to wait until labor begins before you do a cesarean section?

Dr. George F. Pendleton, Kansas City, Mo.—It seems to me that when we do a cesarean section we admit that we could not get out of it better. We give up the problem and quit. Three times in the last two years we had everything set for a cesarean. One case was a tuberculous patient and one had a sciolosis. We let the patients go into labor, but did not see how the baby could come. We held off. There was no hurry. Nature did a little dilatation, and by and by gave us a normal delivery. Three times that has happened, followed by normal delivery. I believe there is no harm in delaying a cesarean until the patient goes into labor, and sometimes by just waiting we may get the head through without any trouble.

Dr. W. D. Padget, Lenoir City, Tenn.—The question has been raised of cesarean section. I know a woman in this city who went to Cincinnati, refusing a cesarean operation. They took the measurements and did a craniotomy. This happened three times. Finally she came back and I told her to wait and see if she could not be delivered normally. Since then she has had four perfectly normal deliveries.

Dr. Davidson (closing).—The pelvic measurements were not the only indication for cesarean section. On examining the case the first time, I found, as those who have had tuberculous hip cases know, that the pelvis was very asymmetrical. One side was turned in almost to the median line. Our ordinary measurements did not indicate the full amount of deformity, but by careful examination we found there was no possibility of the head's coming through the pelvis. That was the reason we did not want her to go into labor. I fixed upon the date for the operation by calculating the time she was due and saw no reason for letting her go into labor.

Some think it is necessary for a woman to be in labor a few hours in order to get drainage through the cervix, but I believe that now the doctors who are making cesarean sections say it is unnecessary to dilate the cervix at all, that the uterus will drain thoroughly, especially if you wipe it out with hot gauze at the time of the operation.

PLACENTA PRAEVIA IN A TWIN PREGNANCY*

By Wilbur G. Ruble, M.D.,
Morristown, Tenn.

Mrs. C. B., age 40, a housewife, had had ten children. The pregnancy to be described was the fourth twin pregnancy. All the children were living and well except one that had epilepsy. There were no miscarriages. When I saw her she was eight months pregnant. Uterine hemorrhage began without warning while she was standing before the fire. She had profuse bleeding. She had been feeling badly for about a week, with general pain, discomfort and nervousness. Physical examination, which was just one hour after the time of the hemorrhage, revealed a placenta praevia, marginal, with constant bleeding, and a twin pregnancy. Her pulse was 144. There was evidence of a large amount of blood having been lost. The vagina was full of clotted blood, the os was soft and dilated to about the size of a silver dollar. The placenta was attached to the right of the os with the lower segment detached and protruding through it.

Without any preparation except the washing of hands and arms in warm water, the delivery was begun. The right hand was carried well up into the uterus and podalic version was done. The first baby was delivered with some difficulty, the forceps applied to the head, owing to the large head and the imperfect dilatation of the os. The baby never breathed, although the heart beats were evident for eleven minutes, and every method available was tried to resuscitate it. The hemorrhage stopped as soon as the first baby was delivered. The placenta remained intact, the lower segment loose and protruding from the vagina. The second baby was in shoulder presentation and was delivered without much difficulty, except that a podalic version was done in this case. It was living and apparently vigorous.

The interesting feature of this case was, first, the fourth consecutive twin pregnancy; second, the complication of placenta praevia in twin pregnancy; third, that the hemorrhage stopped immediately after the birth of the first child; fourth, the first baby's heart was beating, but there was no effort to breathe; and fifth, the delivery of the after-coming head with unsterilized forceps, with uneventful recovery of the mother. Except for slight shock and very slight elevation of temperature for three or four days, she was normal.

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*Presented in Case Report Session, Section on Obstetrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

EYE, EAR, NOSE AND THROAT

ORBITAL AND OCULAR TUMORS*

By E. C. Ellett, M.D.,
Memphis, Tenn.

Lantern slides, exhibiting the interesting features and operative procedures of the following cases, were shown:

(1) A congenital limbal growth in a child. Section showed a large mass of cartilage in the tumor.

(2) Recurrent epithelioma of the limbus. Removal followed by the application of radium. No recurrence.

(3) Sections of a primary and recurrent epithelioma of the limbus. Radium failed to prevent recurrence, but cauterization after the second operation was successful.

(4) Epithelioma of the limbus. No recurrence after eight years.

(5) Recurrent epithelioma of lid and ball, after removal by x-ray. Removal of lids, ball and contents of orbit. No recurrence after eight and a half years.

(6) Fibro-sarcoma of the orbit, with glandular involvement. Removal and radium. Recurrence in three months and death in five months.

(7) Primary tumor of the optic nerve. Removed by Knapp's method, with preservation of ball.

(8) Primary tumor of the optic nerve, removed with the eye ball.

(9) Cavernous angioma of the orbit. Removed by Kronlein's method, with preservation of ball.

(10) Sarcoma of orbit. Removed by Kronlein's operation with preservation of the ball.

(11) Osteoma of the orbit. Removal by another surgeon. Death.

(12) Sarcoma of the choroid with extension into a vorticose vein. No recurrence after seventeen years.

(13) A pigmented connective tissue tumor of the choroid. No recurrence after eight years.

(14) Melanotic sarcoma of the choroid. Recent case.

(15) Melanotic sarcoma of the choroid. Recent case.

(16) Melanotic sarcoma of the choroid. Patient of Dr. A. B. Dancy.

(17) Sarcoma of choroid. Fourteen years after removal, death from an abdominal tumor (hypernephroma of liver and kidney).

(18) Sarcoma of choroid. Abdominal metastasis and death in six months.

(19) Melanotic sarcoma of choroid which had burst through the sclera. Removal followed by radium. No recurrence after sixteen months.

(20) Glioma of the retina, which had burst through the sclera. Removal of eye. Death in a few weeks.

(21) Glioma of retina. Recent case. The fellow eye shows a small white intraocular tumor.

(22) Bilateral retinal glioma. Removal of both eyes at an interval of nine months, after unsuccessful treatment by radium.

DISCUSSION

Dr. Harold Bailey, Springfield, Mo.—Have you had any experience with deep x-ray therapy following enucleation for glioma? I now have two patients under observation in each of whom the enucleated eye shows glioma cells extending along the nerve as far as the point of section. I have put both of these patients under radium and now we are following up with deep x-ray. I have never used it before, nor have I found any authority that tells us much about it. In these two cases it was apparently the only thing we had left. I would be glad to hear from anyone present who has used it and with what results.

Dr. Hilliard Wood, Nashville, Tenn.—Last March a woman, aged 36, came to me complaining of headache for three weeks, and impaired vision in the right eye. Vision in the right eye was 20/100; left eye, 20/20. There was no improvement with lenses. The pupil of the right eye was dilated to the maximum with atropin. Examination with focal light and with the ophthalmoscope showed a dark mass commencing at the ciliary region, above and to the outer side, corresponding to from 8 to 12 o'clock, and extending backwards apparently well beyond the equator. The mass was smooth, neither lobulated nor corrugated, and extended apparently about two-thirds of the way from the sclera to the antero-posterior axis of the eye. It was dark chocolate in color, not wavy, and fixed in position. It moved with the eyeball, but without fluctuation. No large vessels were visible in it. It appeared to be a melanotic tumor growing from the uveal coat, displacing the retina inwards. The optic nerve presented no special pathology. Tension was 23 mm. Hg. The field was contracted. Transillumination gave normal reflexes in the left eye and for all parts of the right eye except when the transilluminator was placed over the tumor mass, when there was a total abolition of the light reflex. The left eye showed no pathology.

I diagnosed melanosarcoma of the right eye and advised enucleation. Drs. M. M. Cullom and E. B. Cayce both concurred in this diagnosis and advised enucleation. The heart and lungs were normal, and the urinalysis negative.

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*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

She was operated upon at St. Thomas Hospital under ether. The right eyeball was enucleated and a glass ball was inserted in Tenon's capsule. After enucleation the right eye was bisected by saggital incision extending from the center of the cornea to the center of the O. D. in the meridian of 1 to 7 o'clock. The outer half of the eye showed the tumor located in the upper and outer quadrant, extending from the front area of the ciliary processes backward to the equator. The tumor was covered in its front margin by a brown ciliary process and was covered back of that by a gray retina. It was approximately ½" antero-posteriorly and vertically, and ¼" transversely. The retina was detached in several places and overlay the tumor.

Laboratory examination confirmed the diagnosis of melanosarcoma.

Dr. Adolph O. Pfingst, Louisville, Ky.—One significant lesson we should learn from Dr. Ellett's paper is concerning the prognosis of some of these cases of malignant growths of the eye. We all know that in a general way the prognosis is poor. Many of them terminate in metastases and death within a year or two after enucleation, and others have recurrence of the growth in the orbit and extension to its surroundings. This is my reason for calling attention to Dr. Ellett's cases that lived long after removal, in one instance as long as 17 years. I have a case which I have been observing for twelve years, in which an enucleation was done twelve years ago on account of the presence of a choroidal sarcoma about the size of a pea close to the optic nerve, in which the patient had 20/70 vision. I recall another who lived six years after enucleation, in whom the vitreous chamber was full of melanotic tissue. The cases enucleated in the first and second stage of tumor development naturally offer the best prognosis.

Even after the growth has left the confines of the eyeball the prognosis is not altogether hopeless. About ten years ago I was called into the country to see an emaciated middle-aged man suffering with a very large malignant growth of the eyeball which had involved both eyelids. He presented a rather hopeless condition. A complete exenteration of the orbit was done. Both lids were removed close to the orbital rim, and the entire surface of the orbit and skin edges were cauterized with a hot poker. This man has grown fat and has for ten years done hard work on the farm. Today he shows no recurrence of the growth.

Dr. Ellett (closing.)—I have had no experience with deep x-ray therapy and therefore cannot answer Dr. Bailey's question.

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DR. M. Y. DABNEY, Editor
C. P. LORANZ, Secretary-Manager

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Seventeenth Annual Meeting, Washington, D. C.
November 12-15, 1923

THE WASHINGTON MEETING

November 12th to the 15th is the time set for the Washington meeting of the Southern Medical Association, and all is in readiness for the gathering. The District of Columbia Medical Society has worked hard to make the event a success and has completed a program of entertainment that is most attractive.

LOCATION

Fortunately, Washington itself is a large medical center with its several medical schools and Government and private hospitals. The profession of the city comprises many names of National reputation. In addition to this fact, Washington is less than an hour's ride by train or electric car to Baltimore, and is not far from Philadelphia, not to mention the many Southern cities which are on, or near, the route to and from Washington.

SCIENTIFIC PROGRAM

The eighteen sections have made up programs which are a credit to them. They offer a broad list of subjects and are to be presented in many instances by authorities along their particular lines. They offer a splendid opportunity for learning the latest medical thought as interpreted by men of ability.

CLINICS

The Baltimore profession has been active in arranging a program for the two days, Friday and Saturday (November 16 and 17) following the Washington meeting. They have planned clinics and demonstrations (medical, surgical and in the specialties) at the University of Maryland, St. Agnes Hospital, the Johns Hopkins Hospital, and at the School of Hygiene and Public Health at Johns Hopkins. An alternative is offered by the fact that the University of Virginia, at Charlottesville, will hold similar clinics on the same days.

ENTERTAINMENTS

A list of the entertainment provided for members, visitors and their wives will be found on page 899. It will be seen that there will be a reception by the President of the United States at the White House; a reception to the President and members of the Southern Medical Association and the visitors, and their families; alumni dinners; a golf tournament; various receptions and teas for the ladies; automobile rides; an exhibition cavalry and artillery drill, etc.

SPECIAL RAILWAY RATES

Following the usual custom a special rate of a fare and a half will be offered by all lines within our territory. But to secure this rate a special "Identification Certificate" must be obtained from the Association office, Empire Building, Birmingham, Alabama, and must be presented when the ticket is purchased. The round trip tickets are good from November 8 till the 23rd and will permit of various side trips for pleasure or for medical study. Special convention trains will be

made up from some points in the South (see page 898).

HOTEL ACCOMMODATION

This meeting will be unique in that there will be plenty of hotel facilities near at hand without crowding. A list of hotels and their rates will be found on page 911. Those who expect to go to Baltimore for the clinics after the Washington meeting should bear in mind that the Pimlico races will be held at that time and that hotel spaces will be difficult to secure unless engaged far ahead. Some will doubtless prefer to retain their Washington rooms and visit Baltimore each day by train or electric.

A FINAL WORD

If average weather prevails, the temperature will be crisp and bracing without being cold, although light overcoats will be needed at night. Beautiful Washington, historical Washington and medical Washington all await your arrival. Whether for rest, pleasure or scientific improvement, the Washington meeting probably offers more to the visitor this year than has ever been made possible at a previous meeting of the Association.

NEWER METHODS OF TREATING SYPHILIS

The progress in the treatment of syphilis by chemo-therapeutic methods has, during the past few years, been making rapid strides. The efficacy of novasurol and of silver salvarsan as reported from Germany, that of the several bismuth preparations introduced in France, and that of the special arsenic preparation used by Brown and Pearce at the Rockefeller Institute in New York, are attracting the attention of therapeutists everywhere. Undoubtedly, the judicious use of some of these newer substances is capable of supplementing materially the benefits derivable from arsphenamin, on the one hand, and from the older forms of mercurial treatment, on the other.

Recently, from the Pasteur Institute in Paris, a report has come which, if its findings be corroborated, bids fair to provide us with a new arsenical treatment for syphilis, one in which the drug may be given by mouth instead of by hypodermic injection. Levaditi and his colleagues* have made use of a new compound known as "stovarsol," which they found in animal experiments quickly cured syphilitic affections. They demonstrated also that it possessed strong prophylactic powers against syphilis in rabbits exposed to infection by the sexual route. Later experiments on human beings confirmed the results of their animal tests. If 2 grams of stovarsol were given by mouth within five hours after exposure to infection, no infection occurred. One voluntary subject, a young man who had not had syphilis and whose Wassermann was negative, was inoculated with syphilitic virus. Five hours after the scarification he was given 2 grams of stovarsol by mouth. Lues did not develop and his Wassermann reaction remained negative.

Though the treatment of clinical syphilis by these French observers has thus far been rather limited, the results they report seem promising. They assert that in 30 cases of primary lesion the chancre was healed under stovarsol medication in from five to fourteen days. In secondary syphilis the therapeutic effects were also prompt and favorable, the skin eruptions disappeared after a few days of treatment. Furthermore, they report a case of

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*Levaditi, C., Navorro-Martin, L., Fournier, L., Guenot, L., et, Schwartz, A.: Recherches sur l'action curative et preventive de l'acide acetyloxyaminophenylarsinique (190 ou stovarsol) administre par voie digestive dans la syphilis. Ann. de l'inst. Pasteur, Bd. 36, 11, S. 729-746, 1922.

gummatous syphilis that yielded promptly to treatment with stovarsol.

In administering the new drug they make use of tablets each containing 0.25 grams, giving 1 gram per day every other day until from 12 to 16 grams have been administered in the course of a month. The only disagreeable effects of the drug observed have been the production of slight fever, and occasionally of erythematous or urticarial skin eruptions.

It would, of course, be unwise to jump to the conclusion that we have in this new remedy a thoroughly satisfactory method of treating syphilis by means of a drug administered by mouth. The attention of physicians is called, however, to the report which, since it emanates from the Pasteur Institute, would seem to deserve serious consideration and to merit careful testing in the organized clinics.

ETHYLENE-OXYGEN ANESTHESIA

That a new agent for use as a general anesthetic should excite immediate interest among anesthetists and should find laboratory research workers and practical operating room anesthetists alike eager to investigate, study, and then make clinical application and further observe what has been evolved, emphasizes one definite, admitted fact, that no agent or combination of agents even when administered by the latest and most refined and perfected technic to which they are adapted, completely satisfies, or may be considered ideal. We have seen chloroform superseded by ether, anesthol appear and make for itself a field, and in the past decade or more have seen nitrous oxid-oxygen take its place—a very definite and important one—in our armamentarium of agents applicable to major surgical procedures of any length. All these, and various combinations and sequences of them are in use and have fairly well recognized fields of application and definite limitations. And yet there is a gap which ethylene seems to give some promise of filling.

Luckhardt and Carter, of Chicago, reported their laboratory work with ethylene in March of this year.[1] Their interest was aroused by florists' reports that ethylene gas in hot houses caused blown flowers to "close" and prevented buds from opening. Their experimental work upon white rats, white mice, kittens, rabbits, and dogs convinced them that ethylene gas was an anesthetic with possibilities. Continuing their experiments on themselves, on each other and on some volunteers with results that were encouraging, they concluded that they had gone as far as was possible in the laboratory, and that ethylene was worthy of a clinical trial. They found the Presbyterian Hospital, Chicago, receptive and under the supervision of the widely experienced Chief Anesthetist of that institution, Dr. Isabella Herb, and her associates, ethylene was tried out under the exacting conditions of the operating room. The results of this were reported in some detail,[2] but a brief summary is as follows:

Ethylene was administered in 106 cases, including 15 abdominal sections, and 6 herniotomies in patients ranging from 10 to 64 years of age. There were some cardio-renal cases and one anemia with a hemoglobin of 30 per cent. Other cases were for operations upon the head, perineum, thorax, and extremities. The results were gratifying, and definite advantages are claimed over nitrous oxid-oxygen, with which, of course, rather than with ether, comparison is made. These advantages are principally as follows: smoother induction, without an excitement stage, and without a sense of

1. Luckhardt and Carter: J. A. M. A., March 17, 1923, p. 765.
2. J. A. M. A., May 19, 1923, p. 1440.

suffocation; and no cyanosis, and much better relaxation. Upon this latter advantage ethylene must make its claim for a permanent place. It is our belief that should ethylene gas be proven safe, its place is assured, not for routine use but for selected cases. Should it be proven equally as safe as nitrous oxid and have the additional advantage of producing a deeper anesthesia, it might well supersede that trustworthy agent were it not for a disadvantage which will necessarily exclude it from the operating room in certain cases and under certain conditions, and that is that ethylene gas mixed with air or oxygen is an explosive. The manufacturers now warn against its use in the same room with any exposed fire, or any electrical equipment where there might be exposed sparks. This, of course, includes cauteries, electric aspiration and vaporizing machines, fans, etc.

There is a smooth, unexcited induction and an increased depth and greater relaxation. At present it does not seem possible to achieve a degree of anesthesia beyond the first stratum of the third stage (Guedel's classification), and that degree is usually insufficient when any manipulation extending into the upper abdomen and about the diaphragm becomes necessary.

The technic of ethylene administration is about the same as that for nitrous oxid, save that considerably more oxygen is given with the gas, 16 to 20 per cent. The oxygen should not be less than this lower figure; and if a satisfactory anesthesia is not achieved, it is much better to augment the gas with sufficient ether in upper abdominal or other difficult cases. A disquieting symptom that has been at times observed is a sudden, rather marked acceleration of the heart action with arrythmia. It is probable that a too concentrated ethylene disturbs the governor-like action of the vagus and that persistence in such an administration would be disastrous, as evidenced by an accelerated heart action and arrythmia when the organ is diminished. With this knowledge such disaster would be due to carelessness. There is no agent for anesthesia that is entirely foolproof.

With ethylene, as with nitrous oxid, any danger will develop only during the administration. These gases act solely while being administered. There is no cumulative action, and they are promptly and entirely eliminated within a few minutes after administration is stopped, regardless of the length of time administration has continued. We know that dangerous gases, even those whose deleterious effects terminate fatally, cause symptoms immediately upon their inhalation; so it is safe to assume that after a return to normal consciousness, no delayed toxemias or poisoning need be feared.

The proceedings of the Congress of Anesthetists in Chicago, and of the Southern Association of Anesthetists in Washington this month, should throw much light upon ethylene anesthesia, as both meetings have several papers on the subject scheduled in their programs. These meetings will bring out the consensus of opinion from the entire country, and will reflect the aggregate views of those anesthetists and laboratory workers who have had the largest experience with this gas to date.

Book Reviews

A Simple Treatment for Tuberculosis. By Owen F. Paget, M.D. With an Introduction by J. George Adami, M.D., F.R.S., and Prefatory Remarks by W. P. Birmingham, B.A., M.D., Hon. Surgeon, Public Hospital, Fremantle, Western Australia. New York: Wm. Wood & Co., 1923.

In his introduction Dr. Adami calls attention to one of the long-recognized functions of the upper nasal passages that is, the bactericidal properties of the epithelial cells lining these passages, this function in addition to the mechanical cleansing of the air due to the anatomical arrangement of these passages. Sufficient attention has not been paid to this bactericidal action of these cells in the study of immu-

(Book Reviews continued on page 912)

Seeing Washington*

By the time that members of the Southern Medical Association read these lines the Seventeenth Annual Meeting will be a thing of the present. All will be hurry and bustle in preparation for the long-planned trip to Washington, the Capital City of the Nation. All trains from the South and West steaming into Union Station will bring delegates, their families and friends to the city, wisely chosen as the place of meeting for the Seventeenth annual convention. Many of the delegates and their families will have been to Washington before, but many others will be making their first trip. But whether belonging to the first or to the second of these categories, every visitor will be anxious so to arrange his time and his itinerary that he may acquaint himself at close range with the principal points of interest.

Probably nowhere else in America can so many interesting things be seen dear to the heart of the citizen as in Washington. Although younger than the Nation which it represents as its capital, its start was early enough to witness the early struggles of the weak Republic, and its life has been intimately connected with every political phase of the rise of that little Nation to the dizzy height of the richest and most powerful nation of the Globe.

Once off the train at Union Station, the expectant visitor, if he does not allow himself to be whisked off instantly to his hotel in an automobile, may walk out upon the Plaza south of the station; and if the skies are favorable the first sight to greet his eyes in the distance will be the beautiful dome of the Capitol, resplendent in the sun or moon with the Goddess of Liberty reflecting their rays, a picture calculated to arouse the wonder and admiration of the most phlegmatic. It is not surprising that a good view of the Capitol building should excite lofty feelings, for it is universally agreed to be the most impressive public building on earth, the wonder building of the world. A few others may be larger, or taller, or older, a lesser number more ornate, but none more beautiful. To the eyes of an American it is sacred.

Let him walk if he will to the center of the rotunda and he may look through a long corridor to the south and if perchance the door is open and Congress is in session he may see the Speaker of the House of Representatives in the chair. Let him turn to the north and through an equal vista he may see the Vice-President of the United States presiding in the Senate. Perhaps the entire Supreme Court of the United States with the distinguished and genial Chief Justice at their head may pass before him in review.

Looking east through the great front portico he will view the place where more than a score of presidents have been inaugurated.

Looking upward to the center of the great dome, he becomes awestruck when he contemplates that 9,000,000 pounds of bolted iron plates are suspended over his head. There is no need, however, to be frightened, it is said, as only some terrific earthquake greater even than the fearful catastrophe of Tokyo could crumble it to the ground.

Pennsylvania Avenue. The Washington, New Willard and Raleigh Hotels on the left, Post-office Department on right, with the Capitol Dome in the distance.

*By W. M. Barton, M.D., Chairman of Sub-Committee on Publicity, of the General Committee on Arrangements, Washington, D. C.

1. Library of Congress. 2. Senate Office Building (House Office Building is of similar architecture). 3. The Capitol. 4. The White House facing Pennsylvania Avenue. 5. Bird's-eye view with White House most prominent and the Treasury, the Washington Hotel and New Willard Hotel to the right.

The outside of the dome is always pearly white for the simple reason that over 4000 pounds of paints are spread upon it every few years. The job takes 35 men over three months to accomplish.

Figures are proverbially tiresome, but it may not be amiss to say that the Capitol building is over 700 feet long, covers over 150,000 square feet and, including the grounds, cost over $25,000,000. Staggering as this figure of cost really is, it is interesting to note that if the German nation were to pay its reparations debt in Capitol buildings, it would require 1350 of them.

The bronze figure surmounting the dome, the Statue of Freedom, usually called the Goddess of Liberty, weighs 15,000 pounds and was placed in position when the Capitol was completed in 1863, during the midst of the strife of the Civil War. If the visitor's legs and heart are sufficiently stout and strong, a climb up stairs to the top of the dome will well repay him. On the way up he may obtain a close view of the wonderful but incomplete frescoes of Brumidi and Costaggini, Italian painters, both of whom died while working on these paintings, and once at the top, he may look out with an unobstructed vision upon the beautiful panorama of the city and its encircling hill and silvered waters with long avenues radiating from the Capitol like the spokes of a wheel.

Of course the visitor will take in Statuary Hall, a room with more historic associations than any other room in America. In this chamber the old House of Representatives met for 40 years.

Here Abraham Lincoln, John Quincy Adams, Horace Greeley and Andrew Johnson served in the same Congress. Here Henry Clay welcomed LaFayette and John Marshall administered the oath of office to Presidents Madison and Monroe. In 1825, the House here balloted for president in a contested election, and John Quincy Adams won over Andrew Jackson. Here John Quincy Adams, serving as a Member of Congress after he had been president, was stricken with apoplexy and died; a bronze star in the floor marks the spot where he fell. The old gallery where Dickens once sat and looked down upon the Chamber is now closed and the worn staircase cannot be seen. One can picture in the imagination the figures of many celebrated men in the political history of the Nation during the first half of the Nineteenth Century. One can see in the mind's eye the tall, gaunt figure of John Randolph, of Roanoke, stalking into the room with white boots and jingling spurs, throwing down his squirrel cap and homespun suit upon the desk, drinking his tall glass of dark beer handed to him by an attendant and jumping into debate with his thin and piping voice. Randolph lived in Georgetown as did many Southern members of Congress, and his picture is still extant, galloping along the muddy streets and including Pennsylvania Avenue on his way to the Capitol.

Religious services were held in Statuary Hall during the Civil War period. The room was converted into an American Westminster Abbey in 1864, since which time many of the states have contributed statues of their most distinguished dead. Another room in the Capitol is especially revered, namely, the Supreme Court Chamber, since besides its hallowed association with that great tribunal it was in the earlier days the Senate Chamber of the United States, and its historic walls have resounded to the voice of Clay, Calhoun and Webster. The Louisiana Purchase Treaty was confirmed here, and the Monroe Doctrine here proclaimed.

Few persons know or realize that under the rotunda is a tomb. It is, however, an empty tomb. It was intended to be the sepulchre of Washington, but destiny decreed otherwise and the remains of the Father of His Country have rested for a century and a quarter at Mount Vernon.

It would require a volume to describe all the points of interest in the Capitol. To the visitor who has time to do so the best advice which can be given is to employ one of the official guides, who for a nominal fee will show him through the building.

From the Capitol to the White House will usually be through Pennsylvania Avenue. Pennsylvania Avenue! We repeat the name. There is no street in any city of our great country so entitled to distinction in history as this. It has borne the footprints of every president and vice-president of our Republic; also that of every senator and representative in Congress; every cabinet officer, supreme judge and ambassador. Every inaugural procession beginning with Jefferson's has paraded along its famous way. Think of the thousands of people distinguished in our country's history, and the millions of American citizens who have gazed along its historic vista. All the messages and documents back and forth between the Capitol and White House for a century, and more, have been carried over it. Along it have passed the funeral corteges of three martyred presidents. Only a few weeks ago its historic surfaces resounded with the muffled tread of men and horses accompanying the catafalque draped in the stars and stripes which covered the inanimate form of the President of the United States, the late Warren Gamaliel Harding.

At Pennsylvania Avenue and Fifteenth Street one abuts, as it were, into a nest of public buildings clustered together and faced as well as backed by beautiful parks. In the center of this group is the famous and historic White House or President's Mansion. To the east is the great Treasury, and to the west is the State, War and Navy Building.

Every visitor to the Convention will desire to visit the White House, the home of Calvin Coolidge, the President of the United States. During the presidency of Theodore Roosevelt the White House was enlarged, remodeled in arts and certainly improved from a practical and even in an esthetic sense. The cost of these improvements was nearly half a million dollars. The principal additions made at the time were the long wings on the east and west which without detracting from the beauty of the central structure, have given much more room for the transaction of the voluminous business of the chief executive. The original White House constructed by Hobson had wings for offices and servants' quarters, but these were not restored in the reconstruction following the burning by the British in 1814. The street in front of the White House, really a part of Pennsylvania Avenue, is sometimes called Executive Avenue and separates the mansion from

1. Corcoran Gallery of Art. 2. Continental Memorial Hall (D.A.R. Building). 3. Red Cross Building. 4. Pan-American Union. 5. New National Museum. 6. Army Medical Museum and Library.

LaFayette Square. This beautiful park, in the earliest days of the city, was a parade ground. In 1796, the Washington Artillery Company paraded on it, and when the Father of His Country retired from office in 1797 and passed through Washington, a salute of 16 guns was fired by this company here. In those days the beautiful park with its statues was an open field.

The Treasury and State, War and Navy Buildings are on ground originally occupied by executive buildings long since gone and forgotten. When the Government moved to Washington in 1800 the Treasury Department was the largest executive branch of the Government and had seventy clerks in all,—quite a contrast to its present thousands. The present building was completed in 1841. Almost every stranger to the city visits the Treasury to see the girls counting the money which has been brought about a million dollars' worth at a time in steel encased wagons, guarded by armed messengers, from the place of its manufacture, the Bureau of Engraving and Printing. The destruction of old, worn-out money and its reduction to pulp in the steel grinders is a sight interesting to behold.

The State, War and Navy Building is the largest building in the world constructed entirely of granite. It cost over $10,000,000.

Looking south over the Ellipse from the south bounds of the White House, a colossal obelisk of marble and granite is seen raising its glistening peak to the skies, the Washington Monument. This shaft is admittedly the greatest piece of masonry in the world. It is a colossal obelisk of mammoth proportions, majestic in simplicity. It is the loftiest memorial in the world and the most costly and imposing monument ever erected to man. At the very top is an aluminum pyramid, the point of which is 555 feet from the ground. It is said that a plumb line suspended from the top of the monument inside shows less than three-eighths of an inch deflection. The weight of the monument is over 81,000 tons. Its foundation is constructed of solid granite blocks 146 feet square and 36 feet deep. The monument bends a little by the heat of the sun striking its southern side. This deflection is a few hundred thousandths of an inch to the north. High winds are felt by it, rigid and massive as it is, and vibrations of the earth's crust are registered by it. Lightning has struck the monument many times, but it is conducted to the earth through special interior columns provided for the purpose. The cornerstone was laid in 1848 and, after many vicissitudes, was completed in 1884. Its total cost was about one and a quarter millions. A staircase of 900 steps winds its way to the top, which is seldom negotiated except for purpose of descent. The elevator takes seven minutes to ascend. From the top a beautiful view may be obtained through the six windows.

Directly west of the Monument and in full view from the grassy mount upon which the memorial to the Father of His Country majestically mounts to the clouds is another and more recently built memorial to one of the Nation's heroes, the martyred President Lincoln. "The American people," said Taft, "waited fifty years for a national memorial to Abraham Lincoln. Visible in its distant beauty from the Capitol, whose great dome typifies the Union which he saved; seen in all its granduer from Arlington, where lie the Nation's honored dead who fell in the conflict, Union and Confederate alike; it marks the restoration of the brotherly love of the two sections in this memorial of one who is as dear to the hearts of the South as to those of the North."

The Lincoln Memorial was under construction for a period of ten years. "The proportions of the memorial are so fine," says Taft, "that its great mass and height and length and breadth are surpassed in its unity." The outside columns are Doric, the inside Corinthian; the colossal figure of Lincoln in Georgia marble, by French, is overwhelmingly impressive. One of the best of the distant views of the memorial is to be had from the heights of Arlington across the Potomac from the porch of the former home of the illustrious General Robert E. Lee.

Arlington National Cemetery and Mount Vernon will constitute two subjects, each one worthy of extensive treatment, but the limitation of space in this article precludes any attempt to define their beauty and charm.

Mount Vernon, the tomb of Washington, is the Mecca of all Americans. The quickest way for members of the Convention to reach it is by the Washington-Virginia Railway. Cars leave Twelfth Street and Pennsylvania Avenue every thirty minutes from 9 a. m. to 3:30 p. m.

Arlington National Cemetery, with its new marble amphitheater with a seating capacity of 5000 people, its mansion, the home of the Lees, its Sylvan Temple, and above all its thousands of graves of known and unknown dead, will be a point of great interest likely to attract many of the visitors, their families and friends.

The Library of Congress, east of the Capitol and facing it, is housed in the largest and most elaborate library building in the world. The building covers nearly four acres. The stacks cover over a hundred miles of shelves. The building was completed in 1897 at a cost of over $6,000,000. The Library of Congress is the third largest library in the world, being only exceeded by the British Museum, at London, and the Bibliotheque National, at Paris. It contains over 3,000,000 volumes. The interior decorations are perhaps more elaborate than any other of the many public buildings in Washington, and are well worth seeing.

There are instances of educated people who, upon visiting the wonder-building for the first time, have shed tears at its beauty, but it remained for "Lo, the poor Indian," to make a really cryptic tribute. Many Indian tribes in full regalia of war paint, blanket and feathers visit the Capital, and it is no uncommon sight to see them on Washington streets. A "big chief" in blankets and his picturesque native costume had been shown through the Library by some guide. He stood outside looking up at the gold dome. After having viewed it all in silence,

1. Amphitheatre, Arlington National Cemetery and burial place of the Unknown Dead of the World War. 2. Department of the Treasury. 3. Lincoln Memorial. 4. Panorama of Mall. 5. The Washington Monument. 6. Departments of State, War, and Navy. 7. George Washington Home, Mount Vernon.

he uttered: "Man make it?" That was all, but a real tribute.

Facing along Seventeenth Street on the west side south of Pennsylvania Avenue are several buildings of great beauty and importance. These are the Corcoran Art Gallery, the Red Cross, the Memorial Continental Hall and the Pan-American Union Buildings. Obviously it will be impossible to describe in detail the beauty of these structures. The Pan-American Union is partic-

ularly beautiful and is by some considered the most remarkably exquisite structure of its size in the world.

To give a list of all the places of interest in Washington where the visiting physicians and their friends might find edification and delight is impossible. The time of the visitor will be necessarily limited and much circumscribed by the scientific program of the meeting. There may be those, however, who might find it particularly useful or pleasant to them to visit certain localities which are not mentioned. Many, of course, will take "Seeing Washington" busses, and in this quick diverting manner become acquainted with the lay of the land. Other places of interest worth mentioning are the Post Office, Patent Office Buildings, the Bureau of Engraving and Printing, Rock Creek Park, and Potomac Park, the Pension Office, the Naval Radio Station, the Department of Justice, the Weather Bureau, the Smithsonian Institution, the National Museum, the Army Medical Museum and Library, the Bureau of Fisheries, the National Academy of Science, the Naval Observatory, the Botanical Gardens, the National Bureau of Standards, the Government Printing Office, Bolling Airplane Field, Fort Myer, the War College, the District Building, the Public Library, the Carnegie Institute and the house where Lincoln died.

General headquarters and registration will be at the New Willard. A good but inexpensive guide book is always a *sine quo non* to one visiting a strange city. Brooks' "What to See in Washington, and Where to Go" (50 cents), may be recommended, but any standard guide will do.

It is perhaps a little difficult to analyze the fundamental elements of the charm of Washington to the visitor. That it has great charm, no one has ever denied. The charm lies in the blending of an infinite number of beauties, as the charm of the rainbow lies in the blending of its colors. Hildebrand says, "See Mecca and die," is the prayer of the Mohammedan. "Let us go to Washington and live," seems to be the fervent aspiration of more and more Americans. Certain it is that over and beyond all the information the visiting members of the Southern Medical Association may carry from the meeting to their homes in the four corners of the South, not the least of the pleasant recollections will be the pictures of the fair city which is their capital, and which they will forever treasure in their minds.

GOLF AT THE WASHINGTON MEETING

Yes, there will be a real golf tournament during the meeting in Washington! Play will be over the Championship Course of the Columbia Country Club.

We want every golfing member of the Association to bring along his clubs. Let's get together on the links, have a good time and make this the best tournament ever.

There will be the usual prizes and a general get-together for the golfers. Send in or bring with you your handicap and par for your home course. Details of the tournament will be announced later.

H. A. Fowler, *Chairman Golf Com.*,
Stoneleigh Court, Washington, D. C.

WOMEN PHYSICIANS

The medical women of Washington are hoping for a large attendance of medical women at the meeting of the Southern Medical Association, November 12-15. Some special entertainments for the medical women who attend are being arranged and the form this entertainment will take depends in a large measure on the number of women physicians who attend. Dr. A. Frances Foye, 1807 R Street, N. W., Washington, D. C., Chairman of the Committee on Women Physicians, is very anxious to know the names of all women physicians who plan to attend.

ALUMNI REUNIONS

The University of Maryland Alumni Association, comprising three schools, University of Maryland, College of Physicians and Surgeons and the Baltimore Medical College, have arranged for their headquarters at the Raleigh Hotel. It is requested that alumni register as early as possible so arrangements can be made for alumni dinners and other entertainments. Dr. R. P. Bay, 1800 North Charles Street, Baltimore, is in charge of the details.

The University of Louisville, School of Medicine, comprising all former Louisville medical schools, will hold their alumni reunion dinner at the New Willard Hotel, Wednesday evening, November 14. All alumni who expect to attend should write at once to Dr. Emmet F. Horine, Francis Building, Louisville, Ky., and make reservation. Dr. Horine's address will be care New Willard Hotel after November 12.

Alumni dinners and reunions are being arranged for the University of Virginia, Medical College of Virginia, Tulane University, Emory University (Atlanta Medical College), Vanderbilt, Johns Hopkins, University of Texas, Baylor University, University of Pennsylvania, Georgetown Medical School and others. At the time of going to press no announcement has been made as to headquarters of these various schools and

The Headquarters Hotels. 1. The New Willard. 2. The Raleigh. 3. The New Ebbitt. 4. The Shoreham. 5. The Washington.

where the dinners would be held. Announcements regarding these reunions and dinners will be made at the General Session and in the sections.

RAILROAD RATES

Special reduced round trip rates have been granted by all railroads on the identification certificate plan.

All members of the Southern Medical Association have already been sent a certificate. If you did not get yours, advise the Association office, Birmingham, Ala., at once and another will be sent. Your membership card will not suffice to get the reduced rate—you must have this special form identification certificate to give the ticket agent when purchasing your ticket.

Doctors who are not members of the Southern Medical Association and who wish to attend the meeting may get the reduced rate by asking the Association office for an identification certificate.

SPECIAL TRAINS

The Southern Railway System has already arranged a special train to be known as "The President's Special," which will leave New Orleans Saturday, November 10, 8:10 p. m., arriving at Washington Monday morning, 7:45. Sleepers for this train are being made up at Jackson, Birmingham, Chattanooga, Memphis, Nashville and other points. This train is named "The President's Special" because it will convey the Association's President to the meeting (see page 48 for detailed schedule).

The Kansas City profession announces a special car party leaving Kansas City Saturday, November 10, at noon and arriving at Washington Monday morning at 8:00. This train will be operated over the Missouri Pacific and Pennsylvania lines. Further information regarding this car party may be obtained from Dr. Chas. Wood Fassett, 115 East 31st Street, Kansas City, Mo.

The Texas profession announces special sleepers Dallas to Washington via St. Louis, leaving Dallas Friday, November 9, 4:10 p. m., arriving Washington Sunday, November 11, 1:15 p. m. These special sleepers will operate via the M., K. and T. to St. Louis, and Pennsylvania lines St. Louis to Washington. Dr. Oscar M. Marchman, Medical Arts Building, Dallas, is arranging for this special service and any one who would like to join this party will please communicate with him.

Car parties from other points to be operated over other lines are being arranged. Make the trip more enjoyable by traveling with a congenial group of physicians, many of whom will have their wives.

OFFICERS OF THE MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA

President, Dr. Luther H. Reichelderfer, 1721 Connecticut Ave.

First Vice-President, Dr. J. Russell Verbrycke, Jr., The Rochambeau.

Second Vice-President, Dr. Edith SeVille Coale, 2006 Columbia Road.

Recording Secretary, Dr. Coursen B. Conklin, The Farragut.

Corresponding Secretary, Dr. Prentiss Willson, Stoneleigh Court.

Treasurer, Dr. E. G. Seibert, 1545 I St., N. W.

CHAIRMEN OF WASHINGTON COMMITTEES ON ARRANGEMENTS

General Chairman, Dr. Thos. A. Groover, 1621 Connecticut Ave., N. W.

Vice-General Chairman, Dr. Philip S. Roy, 1200 Massachusetts Ave., N. W.

General Secretary, Dr. Wm. Cabell Moore, 1824 Massachusetts Ave., N. W.

Membership, Dr. Philip S. Roy, 1200 Massachusetts Ave., N. W.

Finance, Dr. Joseph D. Rogers, 1400 M St., N. W.

Hotels, Dr. Noble P. Barnes, Arlington Hotel.

Reception, Admiral Cary T. Grayson, 1600 16th St., N. W.

Publicity, Dr. W. M. Barton, 1730 Connecticut Ave., N. W.

Badges, Dr. Harry S. Lewis, 2839 Connecticut Ave., N. W.

Alumni Dinners, Dr. Tom A. Williams, 1746 K St., N. W.

Meeting Places and Exhibits, Dr. A. Barnes Hooe, 1220 16th St., N. W.

Information, Dr. J. A. Gannon, 1915 Biltmore St., N. W.

Transportation, Dr. W. A. Applegate, Laclede Apartments.

Golf, Dr. H. A. Fowler, 1621 Conn. Ave., N. W.

Entertainment, Dr. Wm. T. Davis, 927 Farragut Square.

Women Physicians, Dr. A. Frances Foye, 1807 R St., N. W.

Automobiles, Dr. Dan L. Borden, The Rochambeau.

Public Health:
- Dr. Geo. M. Kober, Ch'm., 1819 Q St., N. W.
- Mr. W. deC. Ravenel.
- Dr. M. W. Ireland, Surgeon-General U. S. A.
- Dr. E. R. Stitt, Surgeon-General U. S. N.
- Dr. Hugh S. Cumming, Surgeon-General U. S.P.H.S.

Ladies' Entertainment:
- Chairman, Mrs. Wm. T. Davis, 927 Farragut Sq., N. W.
- Vice-Chairman, Mrs. Thos. A. Groover, 1603 16th St., N. W.

HOTELS—See page 911

PRELIMINARY PROGRAM SOUTHERN MEDICAL ASSOCIATION

Seventeenth Annual Meeting, Washington, D. C.

November 12, 13, 14, 15, 1923

PROGRAM OF ENTERTAINMENTS

Tuesday, November 13, 9:00-11:00 p. m. Reception for the President, Members and Guests of the Southern Medical Association, New National Museum.

Thursday, November 15, 12:30 p. m. Reception to Members and Guests of the Southern Medical Association by the President of the United States at the White House.

Golf. Golf at the Columbia Country Club, Chevy Chase, Maryland, each day of the meeting. Bring your clubs along. Entries for the tournament are requested at the earliest moment and should be sent to Dr. H. A. Fowler, Chairman, 1621 Connecticut Avenue, N. W., Washington.

Entertainment for Visiting Ladies

Tuesday, November 13, 4:00-7:00 p. m. Reception and tea at the Washington Club, 1701 K Street, N. W. Mrs. Woodrow Wilson will be the guest of honor.

Tuesday, November 13, 9:00-11:00 p. m. Reception for the President, Members and Guests of the Southern Medical Association, New National Museum.

Wednesday, November 14, 1:15 p. m. Exhibition cavalry and artillery drill, automobile drive and tea. Automobiles will leave the "Zero Milestone" on the Ellipse directly south of the White House at 1:15 p. m.

Thursday, November 15, 12:30 p. m. Reception to Members and Guests of the Southern Medical Association by the President of the United States at the White House.

Entertainment for Visiting Women Physicians

Monday, November 12, 5:00-7:00 p. m. Tea for Women Physicians by the President of the Woman's Medical Society of the District of Columbia, the Rochambeau, 1815 Connecticut Avenue, N. W.

Tuesday, November 13, 6:30 p. m. Complimentary dinner to visiting women physicians by the Woman's Medical Society of the District of Columbia, National Club, American Association of University Women, 1634 Eye Street, N. W.

SPECIAL MEETINGS

Monday, November 12, 12:30 p. m. Luncheon meeting of the Board of Trustees, New Willard Hotel.

Monday, November 12, 6:00 p. m. Dinner of the ex-Presidents of the Southern Medical Association and their wives, New Willard Hotel.

Tuesday, November 13, 12:30 p. m. Luncheon meeting of the Council, New Willard Hotel.

Tuesday, November 13, 6:30 p. m. Dinner meeting of the Presidents and Secretaries of State Medical Associations and State Health Officers, New Ebbitt Hotel.

Tuesday, November 14, 5:00 p. m. The Ninth Annual Meeting of the Women Physicians of the Southern Medical Association will be held at the National Club, American Association of University Women, 1634 Eye Street, N. W. The meeting will be followed by a complimentary dinner given by the Woman's Medical Society of the District of Columbia. Dr. A. Frances Foye, Chairman, 1807 R Street, N. W., would like to know the number who will attend. If you are going please advise her.

Wednesday, November 14, 12:30 p. m. Luncheon meeting of the Council, New Willard Hotel.

Wednesday, November 14, 6:30 p. m. Dinner and round table of Superintendents and Assistant Physicians of State Insane Hospitals, New Ebbitt Hotel.

Alumni Reunions and Dinners. The Medical schools in the territory of the Southern Medical Association and some of the larger schools of the East are arranging for alumni dinners for Wednesday evening. The time and place of these various dinners will be announced at the General Session and in the sections.

CLINICS

The Baltimore profession have arranged Clinics for Friday and Saturday, November 16-17, at Baltimore, complimentary to the Southern Medical Association.

The University of Virginia has also arranged for Clinics Friday afternoon and Saturday morning, November 16-17, at Charlottesville.

The Section on Dermatology and Syphilology will have Clinics in connection with their scientific program—see page 904. Also the Section on Bone and Joint Surgery—see page 905.

BALTIMORE PROGRAM

Friday, November 16, 9:00 a. m.

University of Maryland Hospital:
- Medical Clinics.
- Surgical Clinics.
- Specialties.

Friday, November 16, 2:00 p. m.

Mercy Hospital:
- Medical Clinics.
- Surgical Clinics.
- Specialties.

Johns Hopkins University School of Hygiene.

Friday, November 16, 7:00 p. m.

Supper and General Entertainment, Medical and Chirurgical Faculty Building. A good supper, good music and general fraternizing—no formality, no dress suits, no speeches, unless spontaneous and called out on the moment.

Saturday, November 17, 9:00 a. m.

Johns Hopkins Hospital:
- Medical Clinics.
- Surgical Clinics.
- Specialties.

The Pimlico races are on at this time and those who wish to enjoy some recreation along with the Clinics will have this added attraction at Baltimore.

UNIVERSITY OF VIRGINIA PROGRAM (Charlottesville)

Friday, November 16, 2:00 p. m., and Saturday, November 17, 9:00 a. m.

University of Virginia Hospital:
Medical Clinics.
Surgical Clinics.
Specialties.

On Saturday there will be one of the big football games of the season at the University of Virginia—the University of Virginia plays Virginia Polytechnic Institute. This promises to be one of the most important games of the season and is an added attraction for a stop-over at Charlottesville.

THE PROGRAM

The following sections, allied and visiting associations compose the program for the Washington meeting. The complete program for each of these meetings will be found in this order on succeeding pages:

Section on Medicine.
Section on Pediatrics.
Section on Neurology and Psychiatry.
Southern Gastro-Enterological Association.
Section on Pathology.
Section on Radiology.
Section on Dermatology and Syphilology.
Section on Surgery.
Section on Bone and Joint Surgery.
Southern States Association of Railway Surgeons.
Section on Urology.
Section on Obstetrics.
Section on Eye, Ear, Nose and Throat.
Section on Public Health.
National Malaria Committee (Conference on Malaria).
Conference on Medical Education.
Conference of Southern States Statisticians.
Southern Association of Anesthetists.

SCIENTIFIC EXHIBITS

The Scientific Exhibits will be located at General Headquarters at the New Willard Hotel, and indications are that these exhibits are going to be unusually interesting this year. Any one having something of interest for this exhibit should communicate with the Association office at once.

The Army Medical Museum and Library (the Surgeon-General's Library), 7th and B Streets, S. W., will be open to the visiting physicians, 9:00 a. m. to 4:30 p. m. The officers in charge have extended a most cordial invitation to those attending our meeting to visit the Museum and Library and make full use of the wealth of information there.

A permanent health exhibit will be found in the Arts and Industries Building of the National Museum located on the north side of the Mall between 7th and 10th Streets, S. W. Visitors are most cordially invied to view this exhibit. Open from 9:00 a. m. to 4:30 p. m.

COMMERCIAL EXHIBITS

Our Commercial Exhibits this year are located at General Headquarters in the New Willard Hotel. These exhibits have a real scientific value and physicians who desire to keep abreast of the times and to know about the latest in drugs and medical appliances should spend some time with these exhibits. It will be surprising the great amount of information that can be gotten at these exhibits. At many of these exhibits there is nothing for sale—the representatives of the firms are there to give you the latest information regarding their products. Those who have items for sale will gladly give you full information whether you buy or not.

We call our members' attention again to the closing words of the Report of the Council as presented by its Chairman, Dr. H. H. Martin, at a meeting of the Association several years ago:

"I wish to call attention of the members of the Association to the commercial exhibits and to urge the members to encourage the exhibits by frequent visits. These exhibits are not only educational but interesting, and the exhibitors come to our meetings at great expense to themselves and we should show our appreciation of their presence by calling at their exhibits. If we do not have commercial exhibits we can provide neither the funds nor facilities for taking care of our scientific exhibits as well as other annual features of the Association."

GENERAL HEADQUARTERS

Registration, Information, Mail, Etc.

The New Willard Hotel

The General Headquarters (Registration, Information, Mail, etc.) will be located at the New Willard Hotel, where badges, programs and invitations to social functions will be issued, and matters concerning dues, changes of address, errors, etc., will be given attention.

The Information Bureau and Convention Postoffice are in connection with the Registration Bureau. Competent persons are in charge to give any information or serve the doctors in any way possible. Ask anything you want to know. Mail and telegrams sent care the Association will be given best attention.

Please be sure to register before attending the meetings.

Members of the Association are requested to bring their membership-receipt (blue) card and present when registering. This will greatly facilitate the registering.

EXCERPTS FROM THE BY-LAWS

Sec. 3. Except by special vote, the order of exercises, papers and discussions as set forth in the official program shall be followed from day to day until it has been completed, and all papers omitted will be recalled in regular order.

Sec. 4. No address or paper before the Association, except the addresses of the President and Orators, shall occupy more than twenty minutes in its delivery; and no member shall speak longer than five minutes nor more than one time on any subject, provided each essayist be allowed ten minutes in which to close the discussion.

Sec. 5. All papers read before the Association shall be the property of the Association for publication in the official journal. Each paper shall be deposited with the Secretary when read, or within ten days thereafter, and if this is not done it shall not be published.

No papers shall be published except upon recommendation of the Publication Committee, which shall consist of the Secretary-Editor as Chairman, with the Chairman and Secretary of each section as its constant members.

FIRST GENERAL SESSION

Continental Memorial Hall
(D. A. R. Building)

Monday, November 12, 8:00 p. m.

Called to order by Chairman of Committee on Arrangements, Dr. Thos. A. Groover.

Invocation: Dr. Clovis G. Chappell, Pastor, Mt. Vernon Place Methodist Episcopal Church, South.

Address of Welcome in behalf of the Medical Society of the District of Columbia, Dr. Luther H. Reichelderfer, President.

Response to the Address of Welcome in behalf of the Southern Medical Association, Dr. A. T. McCormack, State Health Officer, Louisville, Ky.

President's Address: "Modern Problems of Preventive Medicine," Dr. W. S. Leathers, University, Miss.

Address: "Medicine as an International Influence," Dr. Geo. E. Vincent, President, Rockefeller Foundation, New York, N. Y.

Oration on Public Health: "Potentialities of Public Health as an Influence for Medical Organization," Dr. W. S. Rankin, State Health Officer, Raleigh, N. C.

Oration on Surgery: "The Surgeon—His Obligations," Dr. J. W. Barksdale, Jackson, Miss.

Oration on Medicine: "William Osler, Clinician-Teacher," Dr. Stewart R. Roberts, Atlanta, Ga.

Report of Committee on Arrangements.

SECOND GENERAL SESSION

Washington Hotel, Rose Room

Thursday, November 15, 2:00 p. m.

Report of the Council
New Business
Unfinished Business
Report of Nominating Committee
Election of Officers

SYMPOSIUM OF THE NEW BORN

L. T. Royster, V.-President, University, Va., Presiding

1. "Some Unusual Problems in the Feeding of the New Born," C. G. Grulee, Chicago, Ill.

2. "Better Pediatrics for the New Born," J. C. Litzenberg, Minneapolis, Minn.

3. "The Care of the New Born from the Public Health Point of View," J. H. Mason Knox, Jr., Baltimore, Md.

4. "The Diagnosis and Treatment of Intracranial Hemorrhage in the New Born," John Foote, Washington, D. C.

Discussion opened by L. R. DeBuys, New Orleans, La.; J. D. Love, Jacksonville, Fla.; W. A. Mulherin, Augusta, Ga.; J. H. Park, Houston, Tex.; F. J. Underwood, Jackson, Miss.

SECTION ON MEDICINE

New Willard Hotel, Small Ball Room

Officers of Section

Chairman—Allan Eustis, New Orleans, La.
Vice-Chairman—Douglas VanderHoof, Richmond, Va.
Secretary—Sydney R. Miller, Baltimore, Md.

Monday, November 12, 2:00 p. m.

1. Chairman's Address: "A Plea for the More General Consideration of Intestinal Toxemia in the Diagnosis and Treatment of Disease" (Lantern Slides), Allan Eustis, New Orleans, La.

2. "Myxoedema and Hypothyroid States" (Lantern Slides), John T. King, Jr., Baltimore, Md.

Discussion opened by T. P. Sprunt, Baltimore, Md.; S. A. White, Washington, D. C.; T. N. Barnett, Richmond, Va.

3. "The Etiology and Treatment of the Usual Gastric Symptoms of Pulmonary Tuberculosis," R. McBrayer, Shelby, N. C.

Discussion opened by A. W. Calloway, Asheville, N. C.; F. B. Adams, Washington, D. C.; C. L. Minor, Asheville, N. C.; L. B. McBrayer, Sanatorium, N. C.

4. "Endocarditis as a Factor in Acute Infections," C. A. Ray, Charleston, W. Va.

Discussion opened by Manfred Call, Richmond, Va.; W. S. Thayer, Baltimore, Md.

5. "Clinical Study of Hypertension," Robert Wilson, Jr., Charleston, S. C.

Discussion opened by L. F. Barker, Baltimore, Md.; M. L. Graves, Galveston, Tex.

6. "Focal Infection: Is It a Practical Theory?" W. T. Wootton, Hot Springs, Ark.

Discussion opened by M. L. Graves, Galveston, Tex.; B. W. Fontaine, Memphis, Tenn.

7. "The Importance of Intensive Diagnostic Study," W. A. Dearman, Long Beach, Miss.

Discussion opened by Stewart R. Roberts, Atlanta, Ga.; Randolph Lyons, New Orleans, La.

Tuesday, November 13, 2:00 p. m.

SYMPOSIUM ON INSULIN

8. "The Insulin Treatment of Diabetes," R. T. Woodyatt, Chicago, Ill.

Discussion opened by G. H. A. Walters, Indianapolis, Ind.

9. "Insulin in the Treatment of Severe Diabetes" (Lantern Slides), J. E. Paullin, Atlanta, Ga.

Discussion opened by J. S. McLester, Birmingham, Ala.; I. I. Lemann, New Orleans, La.

10. "The Use of Insulin by the General Practitioner," Seale Harris, Birmingham, Ala.

Discussion opened by J. E. Paullin, Atlanta, Ga.; Chas. McCann, Baltimore, Md.

11. "The Parasitism of Fat," K. H. Beall, Ft. Worth, Tex.

Discussion opened by J. E. Paullin, Atlanta, Ga.; Seale Harris, Birmingham, Ala.; A. E. Greer, Houston, Tex.

12. "Clinical Studies of the Pancreatic Enzymes in Duodenal Contents" (Lantern Slides), Daniel N. Silverman, New Orleans, La.

Discussion opened by S. K. Simon, New Orleans, La.; T. R. Brown, Baltimore, Md.

13. "The Creatinin Test for Renal Function" (Lantern Slides), Ralph Major, Kansas City, Mo.

Discussion opened by Louis Hamman, Baltimore, Md.; J. S. McLester, Birmingham, Ala.

14. "Spirochetosis Bronchialis. Report of Case" (Lantern Slides), A. E. Greer, Houston, Tex.

Discussion opened by Louis Hamman, Baltimore, Md.; C. C. Bass, New Orleans, La.

Wednesday, November 14, 2:00 p. m.

15. "Multiple Myeloma, with Report of Two Cases" (Lantern Slides), John W. Scott, Lexington, Ky.

Discussion opened by Louis Hamman, Baltimore, Md.; J. C. Flippin, University, Va.; Randolph Lyons, New Orleans, La.

16. "Vascular Crises in the Cerebral Circulation," Lewis M. Gaines, Atlanta, Ga.

Discussion opened by Randolph Lynos, New Orleans, La.; B. W. Fontaine, Memphis, Tenn.; G. Canby Robinson, Baltimore, Md.

17. "A Study of Eczema as an Allergic Phenomenon," W. T. Vaughan, Richmond, Va.

Discussion opened by H. S. Bernton, Washington, D. C.; Sydney R. Miller, Baltimore, Md.

18. "Some Important Etiological Factors in the Production of Cardiovascular Diseases," Noble P. Barnes, Washington, D. C.

    Discussion opened by L. F. Barker, Baltimore, Md.; Maurice Pincoffs, Baltimore, Md.; L. T. Royster, Norfolk, Va.

19. "A Survey of the Intestinal Parasites Found in Territory Supplied by St. Thomas' Hospital, Nashville, Tenn." (Lantern Slides), J. A. Witherspoon and Jack Witherspoon, Nashville, Tenn.

    Discussion opened by K. M. Lynch, Dallas, Tex.; Geo. M. Niles, Atlanta, Ga.; S. K. Simon, New Orleans, La.

20. "The Differential Leucocyte Count in a Subtropical Climate," J. B. Wallace, Tampa, Fla.

    Discussion opened by W. P. Adamson, Tampa, Fla.; R. H. McGinnis, Jacksonville, Fla.; S. R. Miller, Baltimore, Md.

Election of Officers.

SECTION ON PEDIATRICS

Washington Hotel, Rose Room

Officers of Section

Chairman—W. McKim Marriott, St. Louis, Mo.
Vice-Chairman—H. Leslie Moore, Dallas, Tex.
Secretary—Oliver W. Hill, Knoxville, Tenn.

Tuesday, November 13, 9:30 a. m.

1. Chairman's Address: "The Treatment of the Child," W. McKim Marriott, St. Louis, Mo.

2. "Tuberculosis in Infancy," Oscar Schloss, New York, N. Y.

3. "Tongue-Tie, an Important Factor in the Bottle Fed Baby," S. A. Visanska, Atlanta, Ga.

   Discussion opened by Wm. Weston, Columbia, S. C.; W. L. Funkhouser, Atlanta, Ga.

4. "Pyrexias of Obscure Origin," Philip F. Barbour, Louisville, Ky.

   Discussion opened by Ludo Von Meysenbug, New Orleans, La.; R. J. Estill, Lexington, Ky.

5. "Further Observations Upon the Shadows of the Thymus and the Heart" (Lantern Slides), L. R. DeBuys and E. C. Samuels, New Orleans, La.

   Discussion opened by Wm. Englebach, St. Louis, Mo.; Wm. Weston, Columbia, S. C.

6. "Endocrine Therapy in Infancy and Childhood," John Howland, Baltimore, Md.

   Discussion opened by Philip F. Barbour, Louisville, Ky.; Chas. Boynton, Atlanta, Ga.

Wednesday, November 14, 9:30 a. m.

SYMPOSIUM ON DIARRHEA

7. "Bacteriology of Diarrhea," Wilburt C. Davison, Baltimore, Md.

8. "Predisposing and Exciting Causes of Diarrhea," Owen H. Wilson, Nashville, Tenn.

   Discussion opened by D. Lesesne Smith, Spartanburg, S. C.; Eugene Rosamond, Memphis, Tenn.

9. "Treatment of Diarrhea," N. C. Womack, Jackson, Miss.

   Discussion opened by R. M. Pollitzer, Charleston, S. C.; W. L. Funkhouser, Atlanta, Ga.

10. "Therapeutic Value of the Bacteriophage in the Treatment of Bacillary Dysentery" (Charts), Ralph C. Spence and Earl B. McKinley, Dallas, Tex.

    Discussion opened by Arthur G. Jacobs, Memphis, Tenn.; E. A. Hines, Seneca, S. C.

11. "Chronic Heart Disease in Childhood Without Rheumatic Fever," Hugh McCulloch, St. Louis, Missouri.

    Discussion opened by Edward Clay Mitchell, Memphis, Tenn.; Lewis W. Elias, Asheville, N. C.

12. "Pediatrics Popularized," J. Ross Snyder, Birmingham, Ala.

    Discussion opened by Chas. Boynton, Atlanta, Ga.; Frank H. Richardson, Black Mountain, N. C.

Wednesday, November 14, 9:15 p. m.

Pediatric Smoker, 9:15 to 11:00 p. m. University Club, 15th and Eye Streets, N. W.

Thursday, November 15, 9:30 a. m.

13. "Malnutrition of School Children," Noble D. McCormack, Ft. Smith, Ark.

    Discussion opened by J. Buren Sidbury, Wilmington, N. C.; W. A. Mulherin, Augusta, Ga.

14. "Sickle Cell Anemia" (Lantern Slides), V. P. Sydenstricker, Augusta, Ga.

    Discussion opened by John Huck, Baltimore, Md.; W. A. Mulherin, Augusta, Ga.

15. "Therapeutic Fetishes in Pediatrics," John Foote, Washington, D. C.

    Discussion opened by W. M. Barton, Washington, D. C.; John Zahorsky, St. Louis, Mo.

CASE REPORT SESSION

A time limit of five minutes will be strictly enforced during this session for the presentation of each case. Two minutes will be allowed for discussion.

1. "Tetany in a Breast Fed Baby with a Decided Increase in Convulsions After Receiving Saline Hypodermoclysis," Chas. Conrad, Harrisonburg, Virginia.

   Discussion opened by Arthur W. Shawkey, Charleston, W. Va.; I. W. Faison, Charlotte, N. C.

2. "Anemia in the New Born with Report of a Case," H. H. Donnally, Washington, D. C.

   Discussion opened by Borden S. Veeder, St. Louis, Mo.; T. D. Parke, Birmingham, Ala.

3. "Two Cases of Pylorospasm," James H. Atlee, Chattanooga, Tenn.

   Discussion opened by W. W. Harper, Selma, Ala.; Edward Clay Mitchell, Memphis, Tenn.

4. "Pupura in Twin Infants" (Lantern Slides), J. B. Stone, Richmond, Va.

   Discussion opened by L. T. Royster, University, Va.; Lewis W. Elias, Asheville, N. C.

5. "Brain Abscess and Hernia Following Sinusitis," Wm. P. Cornell, Columbia, S. C.

   Discussion opened by Robert A. Strong, Pass Christian, Miss.

6. "Aleukemic Leukemia," W. Byrd Hunter, Huntington, W. Va.

   Discussion opened by J. D. Love, Jacksonville, Fla.; L. T. Royster, University, Va.

7. "Twins with Hypertrophic Pyloric Stenosis," H. Leslie Moore, Dallas, Tex.

   Discussion opened by C. Hilton Rice, Jr., Montgomery, Ala.

Election of Officers.

SOUTHERN GASTRO-ENTEROLOGICAL ASSOCIATION

New Willard Hotel, Small Ball Room

Officers

President—Julius Friedenwald, Baltimore, Md.
Vice-President—J. E. Knighton, Shreveport, La.
Secretary—John B. Fitts, Atlanta, Ga.

Tuesday, November 13, 9:30 a. m.

SYMPOSIUM ON CHRONIC INTESTINAL STASIS

1. President's Address: "Introductory Remarks on the Nature and Significance of Chronic Intestinal Stasis," Julius Friedenwald, Baltimore, Md.
2. "The Symptomatology of Chronic Intestinal Stasis," Chas. G. Lucas, Louisville, Ky.
3. "The Roentgen Ray in the Diagnosis of Chronic Intestinal Stasis," F. H. Baetjer, Baltimore, Md.
4. "Certain Aspects of Intestinal Stasis Occurring in Pulmonary Tuberculosis," A. W. Calloway, Asheville, N. C.
5. "The Medical Treatment of Chronic Intestinal Stasis," Sidney K. Simon, New Orleans, La.
6. "The Surgical Aspects of Chronic Intestinal Stasis," J. M. T. Finney, Baltimore, Md.
7. "The Relationship of the Intestinal Flora to Chronic Intestinal Stasis," C. C. Bass, New Orleans, La.
   Discussion opened by Maurice Pincoffs, Baltimore, Md.; Wm. Gerry Morgan, Washington, D. C.; J. Russell Verbrycke, Jr., Washington, D. C.; H. G. Walcott, Dallas, Tex.; J. Shelton Horsley, Richmond, Va.

Wednesday, November 14, 9:30 a. m.

8. "The Relation of Cardio-Vascular Disease to Symptoms in the Abdomen," John A. Lichty, Pittsburgh, Pa.
9. "A Study of the Symptoms of Achylia Gastrica," Bryce W. Fontaine, Memphis, Tenn.
   Discussion opened by G. C. Mizell, Atlanta, Ga.; A. L. Levin, New Orleans, La.
10. "Further Observations on the Treatment of Lamblia Intestinalis," J. E. Knighton, Shreveport, Louisiana.
    Discussion opened by E. C. Prentiss, El Paso, Tex.; J. L. Jelks, Memphis, Tenn.
11. "Chronic Duodenal Stasis," J. Russell Verbrycke, Jr., Washington, D. C.
    Discussion opened by E. B. Freeman, Baltimore, Md.; G. M. Niles, Atlanta, Ga.
12. "The Modified Lenhartz Diet in the Treatment of Gastro-Duodenal Ulcer," Seale Harris, Birmingham, Ala.
    Discussion opened by J. C. Johnson, Atlanta, Ga.; E. H. Gaither, Baltimore, Md.
13. "Deep X-Ray Therapy in the Treatment of Peptic Ulcer," E. C. Samuel, New Orleans, La.
    Discussion opened by W. O. Nesbit, Charlotte, N. C.; T. H. Morrison, Baltimore, Md.
14. "Diagnostic Errors," C. W. Dowden, Louisville, Ky.
    Discussion opened by F. M. Durham, Columbia, S. C.
15. "The Quantitative Phenoltetrachlorphthalein Test as an Index of Liver Function," A. L. Levin, New Orleans, La.
    Discussion opened by C. W. Dowden, Louisville, Ky.; Marvin H. Smith, Jacksonville, Fla.

Report of Cases.

Election of Officers.

SECTION ON PATHOLOGY

New Willard Hotel, Small Ball Room

Officers of Section

Chairman—A. G. Kelley, Atlanta, Ga.
Vice-Chairman—F. M. Johns, New Orleans, La.
Secretary—Kenneth M. Lynch, Dallas, Tex.

Thursday, November 15, 9:30 a. m.

1. Chairman's Address: "The New Section," A. G. Kelley, Atlanta, Ga.
2. Organization Address: "The Place of Pathology in the Medical Sciences," William G. MacCallum, Baltimore, Md.
3. "The Pathology of Experimentally Induced Dengue Fever," C. W. Duval, New Orleans, La.
   Discussion opened by H. T. Marshall, University, Va.; Leon S. Lippincott, Vicksburg, Miss.
4. "Factors Regulating Cellular Growth and Their Importance in the Explanation of Cancer" (Lantern Slides), Montrose T. Burrows, St. Louis, Missouri.
   Discussion opened by W. McKim Marriott, St. Louis, Mo.; J. A. Lanford, New Orleans, La.; W. R. Pinnell, Lexington, Ky.
5. "The Opportunity in the South for Medical and Public Health Laboratories, as Exemplified by the Pathological Institute of the University of Tennessee, College of Medicine. (1) The Federation of Laboratories Constituting the Pathological Institute. (2) The Demand Upon These Laboratories and Their Growth During the Two Years of Existence of the Pathological Institute," Harry C. Schmeisser and William Krauss, Memphis, Tenn.
   Discussion opened by Stewart Graves, Louisville, Ky.; Elizabeth Bass, New Orleans, La.

Election of Officers.

SECTION ON NEUROLOGY AND PSYCHIATRY

Shoreham Hotel, Ball Room

Officers of Section

Chairman—W. G. Somerville, Memphis, Tenn.
Vice-Chairman—Beverley R. Tucker, Richmond, Va.
Secretary—G. H. Benton, Miami, Fla.

Wednesday, November 14, 9:30 a. m.

1. Chairman's Address: "Who is Responsible for the Drug Addict?" William G. Somerville, Memphis, Tenn.
2. "The Present Status of Intraspinal Therapy in the Treatment of Neurosyphilis," Lewis M. Gaines, Atlanta, Ga.
   Discussion opened by C. M. Byrnes, Baltimore, Md.; M. L. Graves, Galveston, Tex.
3. "Sugar Content of Cerebrospinal Fluid in Syphilis of the Nervous System," A. G. Kelley, Atlanta, Georgia.
4. "Tic Douloureux with Suggestions for Treatment," James H. Randolph, Jacksonville, Fla.
5. "The Clinical Spread of Lethargica Encephalitis (Based Upon the Encephalitic Material at the Barnes Hospital)," Sidney I. Schwab, St. Louis, Missouri.
6. "The Parkinsonian Syndrome, a Late Sequel of Epidemic Encephalitis," G. Wilse Robinson, Kansas City, Mo.
   Discussion opened by J. Cheston King, Atlanta, Ga.; John W. Stevens, Nashville, Tenn.

Thursday, November 15, 9:30 a. m.

7. "Extensor Rigidity Following a Penetrating Wound of Both Hemispheres" (Lantern Slides), C. C. Coleman, Richmond, Va.
   Discussion opened by G. W. Brown, Williamsburg, Va.; Beverley R. Tucker, Richmond, Va.
8. "Situation Psychoses and Their Management," Tom A. Williams, Washington, D. C.
   Discussion opened by Adolph Meyer, Baltimore, Md.; R. M. Van Wart, New Orleans, La.
9. "Antisocial Behavior: Its Genesis and Treatment," Louis E. Bisch, Asheville, N. C.
   Discussion opened by Wm. A. White, Washington, D. C.; Ralph Greene, Jacksonville, Fla.
10. "Mental Hygiene in St. Louis," M. A. Bliss, St. Louis, Mo.
    Discussion opened by W. D. Partlow, Tuscaloosa, Ala.; G. H. Benton, Miami, Fla.
11. "Focal Infections and Toxemias in Disorders and Diseases of the Nervous Sytem, with Some Remarks on Therapy," Curran Pope, Louisville, Ky.

The Army Medical Museum will exhibit neurological preparations.

Election of Officers.

SECTION ON RADIOLOGY

Washington Hotel, Hall of Nations

Officers of Section

Chairman—D. Y. Keith, Louisville, Ky.
Vice-Chairman—J. W. Landham, Atlanta, Ga.
Secretary—W. R. Bethea, Memphis, Tenn.

Monday, November 12, 2:00 p. m.

1. Chairman's Address: "Roentgen Aid in the Acute Abdomen," D. Y. Keith, Louisville, Ky.
2. "Roentgenology of the Osseous Spine," E. H. Skinner, Kansas City, Mo.
   Discussion opened by Frank B. Dickson, Kansas City, Mo.; W. W. Duke, Kansas City, Mo.
3. "Roentgen Diagnosis in Urology," Robert H. Lafferty, Charlotte, N. C.
   Discussion opened by John Armentrout, Roanoke, Va.; Leon J. Menville, New Orleans, La.
4. "Spontaneous Pneumothorax," J. A. Meadows, Birmingham, Ala.
   Discussion opened by John D. MacRae, Asheville, N. C.; Everett S. Lain, Oklahoma City, Okla.
5. "Sinus Development and Roentgen Findings," John J. Shea, Memphis, Tenn.
   Discussion opened by Wm. O. Floyd, Nashville, Tenn.; D. A. Rhinehart, Little Rock, Ark.

Lantern Slides and Case Reports.

Tuesday, November 13, 2:00 p. m.

6. "A Practical Method for the Application of X-Ray Dosage" (Lantern Slides), Henry J. Walton, Howard E. Ashbury and Charles R. Edwards, Baltimore, Md.
   Discussion opened by Chas. A. Waters, Baltimore, Md.; E. A. Merritt, Washington, D. C.
7. "The Management and Measurement of X-Ray Radiation in Deep Seated Malignancies," E. C. Ernst, St. Louis, Mo.
   Discussion opened by R. H. Millwee, Dallas, Tex.; H. G. McCormack, Laurel, Miss.
8. "Fractional Dose Method in the X-Ray Treatment of Skin Malignancies," J. M. Martin and C. L. Martin, Dallas, Tex.
   Discussion opened by E. C. Samuel, New Orleans, La.; J. W. Landham, Atlanta, Ga.
9. "Effect of Irradiation on Malignancy and Patient," S. S. Marchbanks, Chattanooga, Tenn.
   Discussion opened by A. L. Gray, Richmond, Va.; J. H. Walters, Ocala, Fla.

Lantern Slides and Case Reports.

Election of Officers.

Wednesday, November 14, 6:30 p. m.

Raleigh Hotel, Ball Room

Plate Dinner—Joint Session with the Section on Surgery

"Presentation of Radiation in the Female Breast with Special Reference to the Radiation Before and After Surgical Operation."

Radiology: George E. Pfahler, Philadelphia, Pa.
Surgery: W. E. Sistrunk, Rochester, Minn.

The members of all other sections are extended a cordial invitation to attend the dinner, and are urged to make reservations early in order that adequate arrangements may be made.

SECTION ON DERMATOLOGY AND SYPHILOLOGY

Washington Hotel, Room A

Officers of Section

Chairman—J. B. Shelmire, Dallas, Tex.
Vice-Chairman—J. L. Kirby-Smith, Jacksonville, Fla.
Secretary—J. M. King, Nashville, Tenn.

Monday, November 12, 2:00 p. m.

1. Chairman's Address: "Dermatology in the South," J. B. Shelmire, Dallas, Tex.
2. "Purpura" (Lantern Slides), Everett S. Lain and Marion M. Roland, Oklahoma City, Okla.
   Discussion opened by Wm. R. Bathurst, Little Rock, Ark.
3. "Hair Growth," Thomas W. Murrell, Richmond, Virginia.
   Discussion opened by C. Augustus Simpson, Washington, D. C.
4. "A Treatment of Epidermomycoses of the Feet and Hands," Andrew L. Glaze, Birmingham, Ala.
   Discussion opened by Miller B. Hutchins, Atlanta, Ga.; J. M. King, Nashville, Tenn.; Marcus Haase, Memphis, Tenn.
5. "A Remarkable Absence of Arsphenamin Reactions in a Large Syphilis Clinic," Marcus Haase and C. H. Marshall, Memphis, Tenn.
   Discussion opened by H. H. Hazen, Washington, D. C.
6. "Treatment of Syphilis in Dispensary Practice," Earl D. Crutchfield, Galveston, Tex.
   Discussion opened by I. L. McGlasson, San Antonio, Tex.

6:30 p. m.

Annual Dinner, Washington Hotel, Room D

Presiding, Randolph B. Carmichael, Washington, D. C.

Address: "Modern Dermatologic Therapy," Howard Fox, New York, N. Y.

Tuesday, November 13, 2:00 p. m.

Clinic, Dermatology and Syphilis, Medical and Chirurgical Faculty Building, Baltimore. Lloyd W. Ketron, Baltimore, Md.

Wednesday, November 14, 2:00 p. m.

Clinic, Dermatology and Syphilis, Offices of H. H. Hazen and F. J. Eichenlaub, 1912 R Street, N. W., Washington, D. C.

SECTION ON SURGERY

Raleigh Hotel, Ball Room

Officers of Section

Chairman—Irvin Abell, Louisville, Ky.
Vice-Chairman—Frank K. Boland, Atlanta, Ga.
Secretary—J. W. Barksdale, Jackson, Miss.

Tuesday, November 13, 9:30 a. m.

1. "A Consideration of the Diseases of the Thyroid Gland," E. V. Mastin, St. Louis, Mo.
   Discussion opened by Willard Bartlett, St. Louis, Mo.; J. Shelton Horsley, Richmond, Va.

2. "Biliary Obstruction," Dan Collier Elkin, Atlanta, Georgia.
   Discussion opened by J. A. Crisler, Memphis, Tenn.; Frank K. Boland, Atlanta, Ga.

3. "Differential Diagnosis of Appendicitis and Ureteral Stricture," M. Y. Dabney, Birmingham, Ala.
   Discussion opened by Guy L. Hunner, Baltimore, Md.; Nathan P. Sears, Syracuse, N. Y.

4. "Uterus Didelphys, with Some Post-Operative Observations," John H. Blackburn, Bowling Green, Kentucky.
   Discussion opened by J. Shelton Horsley, Richmond, Va.; George T. Tyler, Greenville, S. C.

5. "Thyro-Glossal Cyst and Fistula," Hermann B. Gessner, New Orleans, La.
   Discussion opened by W. E. Sistrunk, Rochester, Minn.; Battle Malone, Memphis, Tenn.

6. "An Appraisal of Surgical Therapy in Peptic Ulcer," Horace Reed, Oklahoma City, Okla.
   Discussion opened by Robert T. Miller, Baltimore, Md.; Arthur W. White, Oklahoma City, Okla.

Wednesday, November 14, 9:30 a. m.

7. Chairman's Address: "Carcinoma of the Papilla of Vater," Irvin Abell, Louisville, Ky.
   Discussion opened by J. Shelton Horsley, Richmond, Va.; Hugh H. Trout, Roanoke, Va.

8. "The Developmental Errors in Fixation of the Ascending Colon. Reporting One Hundred and Ninety Colopexies," A. B. Small, Dallas, Tex.
   Discussion opened by Adams A. McConnell, Dublin, Ireland; K. H. Aynesworth, Waco, Tex.

9. "Some Practical Points About Prostatectomy," Robert C. Bryan, Richmond, Va.
   Discussion opened by Francis R. Hagner, Washington, D. C.; John H. Cunningham, Boston, Mass.

10. "Gastro-Enterostomy Preliminary to Partial Gastrectomy," Julius Crisler, Jackson, Miss.
    Discussion opened by W. D. Haggard, Nashville, Tenn.; Jere L. Crook, Jackson, Tenn.

11. "Arterial Sympathectomy," James F. Mitchell, Washington, D. C.
    Discussion opened by E. S. Judd, Rochester, Minn.

12. "Surgery of the Colon" (Lantern Slides), E. S. Judd, Rochester, Minn.

Wednesday, November 14, 6:30 p. m.

Raleigh Hotel, Ball Room

Plate Dinner—Joint Session with the Section on Radiology

"Presentation of Radiation in the Female Breast with Special Reference to the Radiation Before and After Surgical Operation."

Surgery: W. E. Sistrunk, Rochester, Minn.
Radiology: George E. Pfahler, Philadelphia, Pa.

The members of all other sections are extended a cordial invitation to attend the dinner, and are urged to make reservations early in order that adequate arrangements may be made.

Thursday, November 15, 9:30 a. m.

13. "Pseudo Pancreatic Cyst with the Report of a Case," John S. Helms, Tampa, Fla.
    Discussion opened by Jere L. Crook, Jackson, Tenn.; J. E. Boyd, Jacksonville, Fla.

14. "Tumors of the Carotid Body," H. A. Royster, Raleigh, N. C.
    Discussion opened by J. M. Mason, Birmingham, Ala.; Isidore Cohn, New Orleans, La.; Lucius E. Burch, Nashville, Tenn.

15. "Sterility: A Study Based on a Series of 526 Patients" (Lantern Slides), Lawrence R. Wharton and Guy L. Hunner, Baltimore, Md.
    Discussion opened by M. Y. Dabney, Birmingham, Ala.; E. H. Richardson, Baltimore, Md.

16. "Conservation Versus Ablation of Ovarian Tissue," Dewell Gann, Jr., Little Rock, Ark.
    Discussion opened by C. Jeff Miller, New Orleans, Louisiana.

17. "Present-Day Chronic Appendicitis," Geo. R. West, Chattanooga, Tenn.
    Discussion opened by W. T. Black, Memphis, Tenn.; Leon L. Sheddan, Knoxville, Tenn

18. "Blast Action of Short Barrel Revolvers Causing Large Wounds of Entrance and Small of Exit—Comparative Effects with Other Pistol Wounds and Its Medico-Legal Importance," Joseph D. Rogers and J. Ramsey Nevitt, Washington, D. C.

Election of Officers.

SECTION ON BONE AND JOINT SURGERY

Raleigh Hotel, Ball Room

Officers of Section

Chairman—Willis C. Campbell, Memphis, Tenn.
Vice-Chairman—Fred G. Hodgson, Atlanta, Ga.
Secretary—E. Laurence Scott, Birmingham, Ala.

Monday, November 12, 9:00 a. m. to 12:00 Noon

Clinics at Johns Hopkins Hospital, Baltimore, Md. Wm. S. Baer, George E. Bennett, Rhodes Fayerweather and Associates.

Monday, November 12, 2:00 p. m. to 5:00 p. m.

Clinics at University (of Maryland) Hospital, Baltimore, Md. R. Tunstall Taylor, Compton Riely, Albertus Cotton and Associates.

Tuesday, November 13, 2:00 p. m.

(Raleigh Hotel, Washington)

1. "Operative Treatment of Fractures," Alonzo Myers and J. S. Gaul, Charlotte, N. C.
   Discussion opened by Frank Dickson, Kansas City, Mo.; George E. Bennett, Baltimore, Md.; Burton A. Washburn, Paducah, Ky.; Wallace Billington, Nashville, Tenn.

2. "Malignancy in Bone" (Lantern Slides), F. G. Hodgson, Atlanta, Ga.
   Discussion opened by Frederick A. Baetjer, Baltimore, Md.; Albertus Cotton, Baltimore, Md.; Edward S. Hatch, New Orleans, La.

3. "The Problem of the Industrial Lame Back," Robert B. Osgood and Lawrie B. Morrison, Boston, Mass.
   Discussion opened by Wm. S. Baer, Baltimore, Md.; E. G. Brackett, Boston, Mass.; Wallace Billington, Nashville, Tenn.; E. Laurence Scott, Birmingham, Ala.

4. "Ankylosis of the Elbow; Prevention and Treatment" (Lantern Slides), Isidore Cohn, New Orleans, La.

   Discussion opened by W. R. MacAusland, Boston, Mass.; Willis C. Campbell, Memphis, Tenn.; Wm. S. Baer, Baltimore, Md.

5. "The State's Duty to the Crippled Child," J. Knox Simpson, Jacksonville, Fla.

   Discussion opened by George E. Bennett, Baltimore, Md.; Oscar L. Miller, Charlotte, N. C.; Wm. Beall Carroll, Dallas, Tex.; Henry P. Mauck, Richmond, Va.

6. "Interpretations of Radiographic Studies of Bone Diseases" (Lantern Slides), Howard Elmer Ashbury, Baltimore, Md.

   Discussion opened by Charles A. Waters, Baltimore, Md.; Robert F. Patterson, Knoxville, Tenn.; Wm. T. Graham, Richmond, Va.; W. Barnett Owen, Louisville, Ky.

Wednesday, November 14, 2:00 p. m.

7. "Transverse Tarsectomy for Pes-Cavus with Steppage Gait" (Motion Pictures), Thomas M. Foley, Washington, D. C.

   Discussion opened by A. Bruce Gill, Philadelphia, Pa.; Compton Riely, Baltimore, Md.; George E. Bennett, Baltimore, Md.; John T. O'Ferrall, New Orleans, La.

8. Chairman's Address: "Surgery of the Knee Joint," Willis C. Campbell, Memphis, Tenn.

9. "Deformities of the Extremities Secondary to Burns" (Lantern Slides), Oscar L. Miller, Charlotte, N. C.

   Discussion opened by R. Tunstall Taylor, Baltimore, Md.; Wyatt S. Roberts, Birmingham, Ala.; F. W. Carruthers, Little Rock, Ark.

10. "Old Dislocation of Os Magnum; Open Reduction and Stabilization," Lawson Thornton, Atlanta, Georgia.

    Discussion opened by DeForrest Willard, Philadelphia, Pa.; Aurelius Shands, Washington, D. C.; E. D. McBride, Oklahoma City, Okla.; R. B. Osgood, Boston, Mass.

Presentation of x-ray plates, apparatus or cases of interest. Each speaker to be limited to ten minutes. Visitors and section members are urged to take part in these informal presentations. Arrangements will be made for display of x-rays and slides. Those wishing to present something will confer a favor by notifying the Secretary in advance of the meeting. (This can be made the feature of the program. All are invited to take part.)

Election of Officers.

If time permits and in event of absentees, the following papers will be read:

11. "Tuberculosis of the Spine" (Lantern Slides), W. H. Sisler, Bristow, Okla.

12. "A Study of Trauma to Upper End of Femur," J. Albert Key, Baltimore, Md.

13. "Some Essentials in Treating Fractures and New Appliances for Carrying Them Out" (Lantern Slides), Carlyle Cooke, Winston-Salem, N. C.

SOUTHERN STATES ASSOCIATION OF RAILWAY SURGEONS

Raleigh Hotel, Ball Room

Officers

President—W. W. Harper, Selma, Ala.
Vice-President—S. S. Gale, Roanoke, Va.
Secretary—J. W. Palmer, Ailey, Ga.

Monday, November 12, 9:30 a. m.

1. "Railway Sanitation," W. F. Smith, Little Rock, Ark.

   Discussion opened by F. Walter Carruthers, Little Rock, Ark.; W. H. Fennell, Catawba, S. C.

2. "Conscious and Unconscious Exaggerations of Symptoms and the Methods of Differentiating Those Based on Organic Changes from Those that Have a Psychogenic Foundation," Irving J. Spear, Baltimore, Md.

   Discussion opened by Thos. H. Hancock, Atlanta, Ga.; E. T. Newell, Chattanooga, Tenn.

3. "Infections of the Hands and Fingers," W. P. Bradburn, New Orleans, La.

   Discussion opened by H. C. Dozier, Ocala, Fla.; J. U. Ray, Woodstock, Ala.

4. "Focal Infection as Met with in Practice," Cleveland Thompson, Millen, Ga.

   Discussion opened by W. T. Graham, Richmond, Va.; Alonzo Myers, Charlotte, N. C.

5. "Diagnosis and Treatment of Ruptured Duodenal Ulcer," H. R. Shands, Jackson, Miss.

   Discussion opened by Joe P. Bowdoin, Adairsville, Ga.; J. K. Cowherd, Cumberland, Md.

6. "After Treatment of Joint Injuries," J. N. Baker, Montgomery, Ala.

   Discussion opened by D. Z. Dunott, Baltimore, Md.; LeRoy Long, Oklahoma City, Okla.; H. G. Hill, Memphis, Tenn.

7. "The Victories of the Disabiliteer," L. S. Oppenheimer, Tampa, Fla.

   Discussion opened by W. A. Monroe, Sanford, N. C.; J. H. Miller, Cross Hill, S. C.

Monday, November 12, 2:00 p. m.

8. President's Address: "Focal Infection—Cause of Prolonged Disability in Injuries," W. W. Harper, Selma, Ala.

9. "The Treatment of Joint Injuries," J. S. Stone, Boston, Mass.

SYMPOSIUM ON FRACTURES

10. "The Patella, with Special Reference to Acute Fracture," H. S. Black, Spartanburg, S. C.

11. "Fracture of the Neck of the Femur" (Lantern Slides), E. Denegre Martin, New Orleans, La.

12. "Fractures of the Pelvis," J. R. Garner, Atlanta, Georgia.

13. "Fractures of the Larynx," T. E. Oertel, Augusta, Georgia.

    Discussion opened by W. H. Goodrich, Augusta, Ga.; A. D. Hardin, Dallas, Tex.; J. G. Hayden, Kansas City, Mo.; F. S. Lynn, Baltimore, Md.; T. C. Thompson, Vidalia, Ga.; F. P. Calhoun, Atlanta, Ga.; E. B. Claybrook, Cumberland, Md.; R. S. Cathcart, Charleston, S. C.

Report of Secretary.

Election of Officers.

Monday, November 12, 5:00 p. m.

Conference of Chief Surgeons, Auxiliary of the Southern States Association of Railway Surgeons

Chairman—Jos. M. Burke, Petersburg, Va.
Secretary—J. W. Palmer, Ailey, Ga.

The Chief Surgeons of Railroads operating in the sixteen Southern states will hold their annual conference to confer and discuss the essential things pertaining to railway surgery, sanitation and other matters of interest to the Chief Surgeons of the South.

SECTION ON UROLOGY

Shoreham Hotel, Ball Room

Officers of Section

Chairman—H. W. E. Walther, New Orleans, La.
Vice-Chairman—A. I. Folsom, Dallas, Tex.
Secretary—J. C. Vinson, Tampa, Fla.

Tuesday, November 13, 2:00 p. m.

1. Chairman's Address: "Gynecologic Urology—A Neglected Field," H. W. E. Walther, New Orleans, La.

2. "The Presenting Symptoms, Findings and Ultimate Diagnosis in Five Hundred Consecutive Cases Presented for Ureteral Catheterization" (Lantern Slides), Raymond Thompson and Lester C. Todd, Charlotte, N. C.
   Discussion opened by John T. Geraghty, Baltimore, Md.; Edgar G. Ballenger, Atlanta, Ga.

3. "Intra-Ureteral Manipulations," George R. Livermore, Memphis, Tenn.
   Discussion opened by John R. Caulk, St. Louis, Mo.; H. W. E. Walther, New Orleans, La.

4. "Indications for Nephrectomy in Non-Malignant Diseases of the Kidney," Austin I. Dodson, Richmond, Va.
   Discussion opened by Jos. F. Geisinger, Richmond, Va.; E. G. Ballenger, Atlanta, Ga.

Wednesday, November 14, 2:00 p. m.

5. "The Surgical Treatment of Benign Prostatism," W. Calhoun Stirling, Winston-Salem, N. C.
   Discussion opened by John T. Geraghty, Baltimore, Md.; H. A. Fowler, Washington, D. C.

6. "Diagnosis and Treatment of Certain Conditions of the Vesical Neck," E. G. Ballenger and O. F. Elder, Atlanta, Ga.
   Discussion opened by H. A. Fowler, Washington, D. C.; George R. Livermore, Memphis, Tenn.; Montague L. Boyd, Atlanta, Ga.

7. "Experimental Nephrotomies," Albert E. Goldstein and Wm. J. Carson, Baltimore, Md.
   Discussion opened by H. A. Fowler, Washington, D. C.; Geo. R. Livermore, Memphis, Tenn.

8. "An Experimental Study of Ureteral Transplantation Into the Lower Bowel" (Lantern Slides), A. I. Folsom and George T. Caldwell, Dallas, Tex.
   Discussion opened by H. G. Greditzer, St. Louis, Mo.; Raymond Thompson, Charlotte, N. C.; Austin I. Dodson, Richmond, Va.

Election of Officers.

SECTION ON OBSTETRICS

Washington Hotel, Rose Room

Officers of Section

Chairman—John T. Altman, Nashville, Tenn.
Vice-Chairman—Edward Speidel, Louisville, Ky.
Secretary—Jas. R. Garber, Birmingham, Ala.

Tuesday, November 13, 2:00 p. m.

1. Chairman's Address: "Progress in Obstetrics," John T. Altman, Nashville, Tenn.

2. "Diagnosis and Management of Hemorrhages in the Later Months" (Lantern Slides), John Osborn Polak, Brooklyn, N. Y.

3. "Practical Points in Pelvic Surgery," Thomas S. Cullen, Baltimore, Md.
   Discussion opened by Cunningham Wilson, Birmingham, Ala.; Lucius E. Burch, Nashville, Tenn.; S. M. D. Clarke, New Orleans, La.

4. "The Active Treatment of Eclampsia and Nephritis Complicating Pregnancy," Greer Baughman, Richmond, Va.
   Discussion opened by M. P. Rucker, Richmond, Va.; B. H. Gray, Richmond, Va.

5. "Prophylaxis in Obstetrics," Ivan Proctor, Raleigh, N. C.
   Discussion opened by M. P. Rucker, Richmond, Va.; Oren Moore, Charlotte, N. C.

Wednesday, November 14, 2:00 p. m.

6. "Hyperemesis," G. Fraser Wilson, Charleston, S. C.
   Discussion opened by Edward Speidel, Louisville, Ky.; Burnley Lankford, Norfolk, Va.

7. "Post-Natal Care," Buford G. Hamilton, Kansas City, Mo.
   Discussion opened by M. P. Rucker, Richmond, Va.; G. D. Royston, St. Louis, Mo.

8. "End Results in Obstetrics," J. W. Beetland, Dallas, Tex.
   Discussion opened by G. V. Morton, Fort Worth, Tex.; George H. Lee, Galveston, Tex.

9. "Perineal Lacerations," Lucius E. Burch, Nashville, Tenn.

10. "Fatalities in Obstetrics," J. George Dempsey, Registrar, Bureau of Vital Statistics, State Board of Health, New Orleans, La.
    Discussion opened by Edward Speidel, Louisville, Ky.; W. A. Plecker, Richmond, Va.

CASE REPORTS—If time permits there will be an open session each day for the presentation of cases. A time limit of five minutes will be enforced for presenting the case; two minutes for discussion.

Election of Officers.

SECTION ON OPHTHALMOLOGY, RHINOLOGY, OTOLOGY AND LARYNGOLOGY

Washington Hotel, Hall of Nations

Officers of Section

Chairman—John H. Foster, Houston, Tex.
Vice-Chairman—John J. Shea, Memphis, Tenn.
Secretary—H. Marshall Taylor, Jacksonville, Fla.

Tuesday, November 13, 9:30 a. m.

1. Chairman's Address: "Post-Diphtheritic Laryngeal Stenosis," John H. Foster, Houston, Tex.

2. "Paroxysmal Cough, a Frequent Symptom of Infection of the Para-Nasal Sinuses" (Illustrated), C. G. Coakley, New York, N. Y.

3. "Persistent Infantile Ethmo-Sphenoidal Sinuses" (Lantern Slides), John J. Shea, Memphis, Tenn.
   Discussion opened by W. B. Mason, Washington, D. C.; Jos. Heitger, Louisville, Ky.; W. P. Reaves, Greensboro, N. C.

4. "Diagnosis and Treatment of Sinus Disease," M. F. Arbuckle, St. Louis, Mo.
   Discussion opened by Robert Caldwell, Little Rock, Ark.; G. B. Trible, Washington, D. C.; F. E. Hasty, Nashville, Tenn.

5. "A Recapitulation of the Indications, Technic and Final Results of the Frontal Sinus Operation Which Has Given Me the Best Results" (Lantern Slides), Robert C. Lynch, New Orleans, La.
   Discussion opened by Virginius Dabney, Washington, D. C.; Lee Cohen, Baltimore, Md.; C. W. Richardson, Washington, D. C.

6. "Some of the Causes of Excessive Bleeding After Tonsillectomies," Samuel Kirkpatrick, Selma, Ala.
   Discussion opened by Jos. B. Greene, Asheville, N. C.; F. C. Schrieber, Washington, D. C.; J. F. Townsend, Charleston, S. C.

Wednesday, November 14, 9:30 a. m.

Exhibition of New Instruments and Appliances

7. "Sixth Nerve Paralysis in Suppurative Affections of the Middle Ear, and Its Complications," Homer Dupuy, New Orlans, La.

   Discussion opened by Oscar Wilkinson, Washington, D. C.; W. A. Weiss, Baton Rouge, La.; E. G. Gill, Roanoke, Va.

8. "Cicatricial Stenosis of the Esophagus: Its Prevention and Treatment" (Lantern Slides and Motion Pictures), Chevalier Jackson, Philadelphia, Pa.

9. "Laryngeal Abscess," John B. Wright, Raleigh, N. C.

   Discussion opened by E. W. Carpenter, Greenville, S. C.; M. C. Pincoffs, Baltimore, Md.; G. M. Maxwell, Roanoke, Va.

10. "The Relationship Between Disease of the Eye and Ear," Dunbar Roy, Atlanta, Ga.

    Discussion opened by E. B. Cayce, Nashville, Tenn.; C. M. Miller, Richmond, Va.; E. Gatewood, Richmond, Va.

11. "Importance of the Systemic Treatment in Pathologic Conditions of the Eye, Ear, Nose and Throat," J. A. Stucky, Lexington, Ky.

    Discussion opened by M. M. Cullom, Nashville, Tenn.; H. H. McGuire, Winchester, Va.; Seale Harris, Birmingham, Ala.

12. "Treatment of Certain Forms of Asthma by Removing Obstructions of Upper Respiratory Tract," E. L. Posey, Jackson, Miss.

    Discussion opened by Edward A. Looper, Baltimore, Md.; C. A. McWilliams, Gulfport, Miss.; W. P. Greening, Paul's Valley, Okla.

Thursday, November 15, 9:30 a. m.

13. "Removal of Intra-Ocular Foreign Bodies," Norman M. Heggie, Jacksonville, Fla.

    Discussion opened by William S. Manning, Jacksonville, Fla.; Clyde A. Clapp, Baltimore, Md.; R. S. Lamb, Washington, D. C.

14. "A Thesis on the Etiology of Glaucoma—And a New Operation" (Lantern Slides), J. W. Jervey, Greenville, S. C.

    Discussion opened by J. W. Burke, Washington, D. C.; Louis S. Green, Washington, D. C.; Henry Dickson Bruns, New Orleans, La.

15. "Some Problems in the Diagnosis and Treatment of Choroiditis," Hiram Woods, Baltimore, Md.

    Discussion opened by E. C. Ellett, Memphis, Tenn.; Edward H. Cary, Dallas, Tex.; H. H. Briggs, Asheville, N. C.

16. "Traumatic Cataract," John O. McReynolds, Dallas, Tex.

    Discussion opened by Harry Friedenwald, Baltimore, Md.; Joseph A. White, Richmond, Va.; J. McC. Hogshead, Chattanooga, Tenn.

17. "Parenteral Injections of Milk in the Therapeutics of Eye Diseases," T. W. Moore, Huntington, W. Va.

    Discussion opened by Halstead S. Hedges, Charlottesville, Va.; W. Herbert Adams, Jacksonville, Fla.; J. C. McDougal, Atlanta, Ga.

18. "Anesthetics in Ophthalmic Surgery," Emory Hill, Richmond, Va.

    Discussion opened by W. H. Wilmer, Washington, D. C.; H. H. Martin, Savannah, Ga.; Harold Bailey, Springfield, Mo.

Election of Officers.

SECTION ON PUBLIC HEALTH

New Ebbitt Hotel, Crystal Room

Officers of Section

Chairman—Henry Boswell, Sanatorium, Miss.
Vice-Chairman—E. B. Wise, Chattanooga, Tenn.
Secretary—Roy K. Flannagan, Richmond, Va.

Tuesday, November 13, 9:30 a. m.

1. Chairman's Address: "The Purposes of a Public Health Section," Henry Boswell, Director Bureau of Tuberculosis, Sanatorium, Miss.

2. Address: Royal S. Copeland, United States Senator, New York, N. Y.

3. "The Elements of a Good Health Department," C. Hampson Jones, Chief Health Officer, Baltimore, Maryland.

   Discussion opened by R. C. Turck, State Health Officer, Jacksonville, Fla.; W. W. McDonell, City Health Officer, Jacksonville, Fla.

4. "Communicable Disease Control in the Rural Districts," H. S. Mustard, Health Officer, Kingwood, W. Va.

   Discussion opened by Carl A. Grote, Greensboro, N. C.

5. "Control of Hookworm Disease in South Alabama," W. G. Smillie, Andalusia, Ala.

   Discussion opened by W. S. Keister, Health Officer, Charlottesville, Va.; S. W. Welch, State Health Officer, Montgomery, Ala.

6. "Diphtheria Control," C. C. Hudson, Chief Health Officer, Richmond, Va.

   Discussion opened by J. S. Mitchener, Epidemiologist, State Board of Health, Raleigh, N. C.

Wednesday, November 14, 9:30 a. m.

7. "Public Health Education—A Duty of Health Departments," G. M. Cooper, Assistant Secretary, State Board of Health, Raleigh, N. C.

   Discussion opened by Roy K. Flannagan, Assistant Health Commissioner, Richmond, Va.; E. A. Hines, Seneca, S. C.

8. "Deaths from Violence in Some of the Larger Southern Cities," J. J. Durrett, Health Officer, Memphis, Tenn.

   Discussion opened by J. P. Kennedy, Atlanta, Ga.; John Callan, New Orleans, La.; J. D. Dowling, Birmingham, Ala.

9. "Public Health Value of Periodic Examinations of Apparently Healthy Individuals," A. T. McCormack, State Health Officer, Louisville, Ky.

10. "The Present Status of Public Health Work," Oscar Dowling, State Health Officer, New Orleans, Louisiana.

11. "Child Hygiene and the Sheppard-Towner Fund," Ethel M. Watters, Associate Director of Maternal and Infant Hygiene, Children's Bureau, Department of Labor, Washington, D. C.

    Discussion opened by Mary E. Brydon, Director Child Welfare, State Board of Health, Richmond, Va.; F. J. Underwood, Director, Bureau of Child Welfare, State Board of Health, Jackson, Miss.

Thursday, November 15, 9:30 a. m.

12. "A Food Poisoning Outbreak Apparently Due to Bacilli of the Enteritidis Group," J. E. Noble, Health Department, Washington, D. C.

13. "An Adventure in State (?) Medicine," J. A. Hayne, State Health Officer, Columbia, S. C.

14. "The Value of Complete and Accurate Vital Statistics," W. A. Plecker, Registrar of Vital Statics, State Board of Health, Richmond, Va.
    Discussion opened by J. G. Dempsey, Registrar of Vital Statistics, State Board of Health, New Orleans, La.; W. S. Rankin, State Health Officer, Raleigh, N. C.; William Travis Howard, School of Hygiene, Johns Hopkins University, Baltimore, Md.

15. "Present Status of Social Hygiene Work in the United States," Mark White, Assistant Surgeon-General, U.S.P.H.S., Washington, D. C.

16. "The Organization of the Joint City and County Health Department," Wm. S. Keister, Health Officer, Joint Health Department, Charlottesville, Virginia.

Election of Officers.

NATIONAL MALARIA COMMITTEE
(Conference on Malaria)

Acting as the Malaria Division of the Section on Public Health

New Ebbitt Hotel, Crystal Room

Officers

Honorary Chairman—H. R. Carter, Assistant Surgeon-General, U.S.P.H.S., Washington, D. C.
Chairman—S. W. Welch, State Health Officer, Montgomery, Ala.
Secretary—L. D. Fricks, Surgeon, U.S.P.H.S., Memphis, Tenn.

Monday, November 12, 2:00 p. m.

1. Chairman's Address: "Some Difficulties from an Administrative Standpoint in the Control of Malaria," S. W. Welch, State Health Officer, Montgomery, Ala.

2. "Observations on the Effect of Impounded Water on Malaria," H. R. Carter, Assistant Surgeon-General, U.S.P.H.S., Washington, D. C.

3. "Malaria Control in the United States—Retrospect and Prospect," L. D. Fricks, Surgeon, U.S.P.H.S., Memphis, Tenn.
   Discussion opened by John A. Ferrell, International Health Board, New York, N. Y.

4. "Seasonal Variation in Malaria Types," M. A. Barber, U.S.P.H.S., Crowley, La.
   Discussion opened by C. C. Bass, New Orleans, La.

5. (a) "Mosquito Infection Under Natural Conditions and Their Blood-Feeding Habits," W. V. King, Bureau of Entomology, Mound, La.
   (b) "The Preferential Feeding Habits of Anopheles Quadrimaculatus Mosquitoes," Carroll G. Bull, Baltimore, Md.
   Discussion opened by F. W. O'Connor, International Health Board, New York, N. Y.

6. "The Spleen Index in Malaria," S. T. Darling, International Health Board, New York, N. Y.
   Discussion opened by K. F. Maxcy, U.S.P.H.S., Montgomery, Ala.

Tuesday, November 13, 2:00 p. m.

Round Table Discussions

1. "Dissemination of Malaria Information."
   Discussion opened by W. S. Rankin, State Health Officer, Raleigh, N. C.

2. "Biologic Investigations."
   Discussion opened by F. W. O'Connor, International Health Board, New York, N. Y.

3. "Major Drainage in Relation to Malaria,"
   Discussion opened by Mr. J. A. LePrince, Senior Sanitary Engineer, U.S.P.H.S., Memphis, Tenn.

4. "Statistical Investigations."
   Discussion opened by W. A. Plecker, Bureau of Vital Statistics, State Board of Health, Richmond, Va.

5. Open Forum.

Executive session.

CONFERENCE ON MEDICAL EDUCATION

New Willard Hotel

Officers

Chairman—M. L. Graves, Galveston, Tex.
Vice-Chairman—W. McKim Marriott, St. Louis, Mo.
Secretary—C. C. Bass, New Orleans, La.

Tuesday, November 13, 9:30 a. m.

1. Chairman's Address: "Progress of Medical Education," M. L. Graves, Galveston, Tex.

2. "Practical Methods in Teaching Obstetrics to Undergraduates," C. R. Hannah, Dallas, Tex.

3. "Some Thoughts on the Limitations of Undergraduate Medical Instruction," William Keller, Galveston, Tex.

4. "University Extension Work in Medicine," James S. McLester, Birmingham, Ala.

5. "Graduate Instruction in Medicine," Lewellys F. Barker, Baltimore, Md.

6. "What Are the Distinctive Functions of Undergraduate and Graduate Medical Schools?" Louis B. Wilson, Rochester, Minn.

7. "Teachers of the Medical Sciences," G. Canby Robinson, Baltimore, Md.

8. "The Future of Full-Time Teachers in Medicine," R. A. Kinsella, St. Louis, Mo.

9. "The Teaching of Palpation and Percussion in Physical Diagnosis of the Chest," J. B. Guthrie, New Orleans, La.

Election of Officers.

CONFERENCE OF SOUTHERN STATES STATISTICIANS OF THE BUREAUS OF VITAL STATISTICS

New Ebbitt Hotel, Red Parlor

Officers

President—W. A. Davis, Atlanta, Ga.
Secretary—R. W. Hall, Jackson, Miss.

Monday, November 12, 10:00 a. m.

The third annual Conference of the Southern Statisticians will be called to order by its President, W. A. Davis, with some introductory remarks.

1. "The Organization of a Model State Bureau with Reference to the Employees," Carl F. Raver, State Statistician, Charleston, W. Va.

2. "Odds and Ends of Each Day in a Bureau of Vital Statistics," F. M. Register, State Director, Raleigh, N. C.

3. "The Importance of Autopsy Before Death Certificates Are Received," J. Geo. Dempsey, State Registrar, New Orleans, La.

4. "How Best to Obtain Death Certificates When No Undertaker is in Charge," W. A. Plecker, State Registrar, Richmond, Va.

5. "Resident and Non-Resident Deaths," S. G. Thompson, State Director, Jacksonville, Fla.

6. "The Sub-Division of Classification of Tetanus Through the Bertillon System," Wm. H. Davis, Chief Statistician, Washington, D. C.

7. "Securing the Cooperation of the Physicians and the Public in Vital Statistics," P. E. Blackerby, State Director, Louisville, Ky.

8. "Dual Causes of Death," H. L. Baugh, State Registrar, Nashville, Tenn.

9. "Discussion of Classification of Death Certificates When Deceased Was Not Attended by a Physician," W. A. Davis, State Director, Atlanta, Ga.

10. "The Problem of Population in Establishing Rates," R. W. Hall, State Director, Jackson, Miss.

11. "Some Benefits that Would Accrue to the South if All Her States Were Accepted Into the Birth and Death Registration Areas of the Bureau of the Census," Wm. H. Davis, Chief Statistician, Washington, D. C.

Election of Officers.

SOUTHERN ASSOCIATION OF ANESTHETISTS

Burlington Hotel

Officers

President—Ansel M. Caine, New Orleans, La.
1st V.-President—Olin W. Rogers, Knoxville, Tenn.
2d V.-President—Nettie Klein, Texarkana, Ark.
Secretary—W. Hamilton Long, Louisville, Ky.
Honorary Secretary—F. H. McMechan, Avon Lake, O.

November 12-14

Address of Welcome: Charles Stanley White, Washington, D. C.

I. SYMPOSIUM ON ETHYLENE

1. President's Address: "Ethylene: An Advance, but Not Perfection," Ansel M. Caine, New Orleans, Louisiana.

2. "Ethylene-Oxygen Anesthesia-Clinical Experience," S. Griffith Davis, Baltimore, Md.

3. "Laboratory Experiments with Ethylene Dichloride" (Laboratory Demonstration), Cline Chapman and O. B. Hunter, Washington, D. C.

4. "Laboratory Experiments with Ethylene and Other Hydrocarbon Gases," Jas. T. Gwathmey, New York, N. Y.

II. PULMONARY SEQUELAE TO ANESTHESIA AND OPERATION

5. "Pulmonary Infarction Following Gynecological Operations: A Clinical and Roentgenological Study," Lawrence R. Wharton and John W. Pierson, Baltimore, Md.

Discussion opened by G. Brown Miller, Washington, D. C.; Gordon Wilson, Baltimore, Md.

6. "Post-Operative Pneumonias," Herman Elwyn, New York, N. Y.

III. ANESTHESIA AND THE TOXIC GOITRE PROBLEM

7. "The Control of Post-Operative Hyperthyroidism and Acidosis by the Intravenous Use of Glucose Solution," Emil Goetsch and E. I. Browder, Brooklyn, N. Y.

8. "The Desperate Risk Goitre in Relation to Operation and Anesthesia," Martin B. Tinker, Ithica, N. Y.

9. "Ether Anesthesia and the Acid Base Balance," Harold Austin and G. E. Cullen, Philadelphia, Pa.

IV. ANESTHESIA FOR DENTAL AND ORAL SURGERY

10. "General Anesthesia and Local Anesthesia in Face and Jaw Surgery," A. L. Miller, D.D.S., Washington, D. C.

11. "Value in N_2O in Oral Surgical Operations," Sterling Meade, D.D.S., Washington, D. C.

12. "Application and Limitation of Conductive Anesthesia," Wilbur S. Benedict, D.D.S., Washington, D. C.

V. EFFECT OF ANESTHESIA ON THE BLOOD

13. "Iso-Agglutinins Before and After Ether Anesthesia," J. G. Huck, Baltimore, Md.

14. "Further Studies of the Blood Before and After Anesthesia," Mary Gage Day, Kingston, N. Y.

15. "Effect of Changes in the Blood Chemical Environment of the Kidney on Kidney Function and Pathology" (Lantern Slides), Wm. de B. MacNider, Chapel Hill, N. C.

VI. MISCELLANEOUS

16. "Oxygen Supply and Demand in General Anesthesia," Robert C. Whitehead, Norfolk, Va.

17. "Importance of Teaching the Signs and Phenomena of General Anesthesia in Detail to Our Medical and Dental Students," James G. Poe, Dallas, Tex.

Dinner—Tuesday, November 13, 7:00 p. m., Burlington Hotel.

Election of Officers.

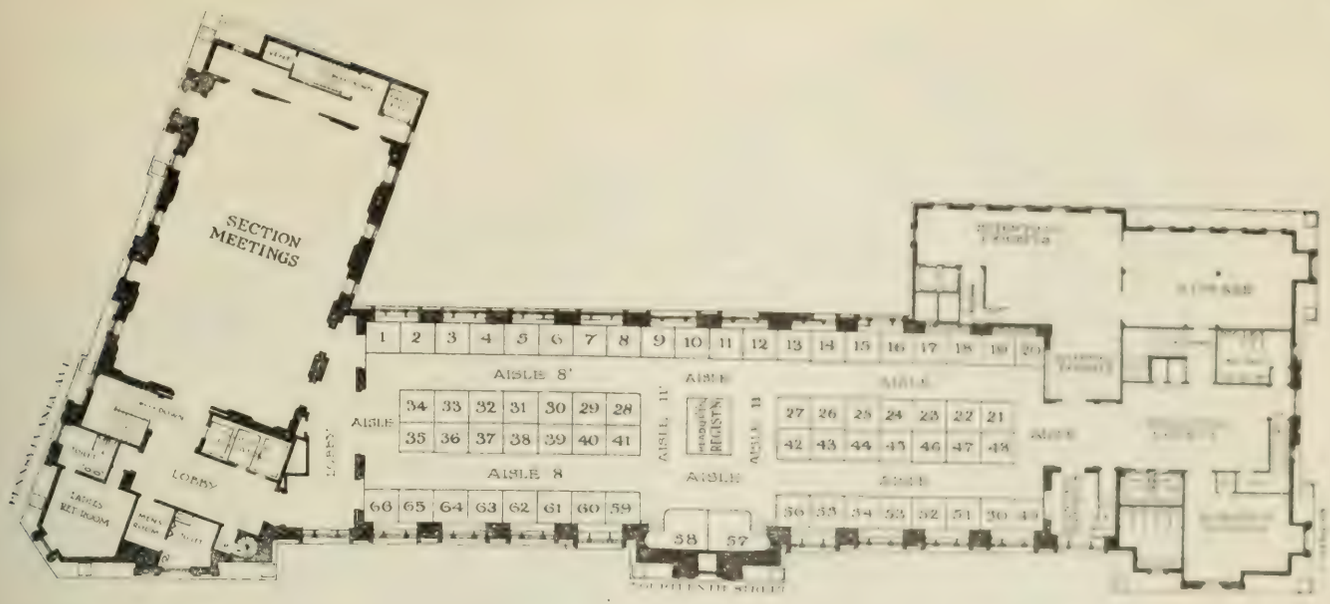
COMMERCIAL EXHIBITS

Ball Room, New Willard Hotel

The Commercial Exhibits, always a feature of our annual meetings, are up to the usual high standard for this meeting. We have a uniform booth and the whole layout will be found very attractive and accessible. The Commercial Exhibits are entertaining and instructive—each physician attending the meeting should spend some time each day with the exhibits. You will find the exhibitors courteous and anxious to answer any questions you may ask.

Here are the names of the exhibitors who have made reservations, with their space number:

	Space No.
Abbott Laboratories, Chicago, Ill.	1
Acme-International X-Ray Co. Chicago, Ill.	65-66
Aloe, A. S. Co.,St. Louis, Mo.	31-32
Appleton, D. & Co., New York, N. Y.	41
Astier, P. Laboratories, New York, N. Y.	26
Bard, Chas. R., New York, N. Y.	14
Bard-Parker Co., Inc., New York, N. Y.	63
Betz, Frank S. Co., Hammond, Ind.	49-50
Blakiston's, P. Son & Co., Philadelphia, Pa.	61
Brady, Geo. W. & Co., Chicago, Ill.	37
Burdick Cabinet Co., Milton, Wis.	55-56
Camerons Surgical Specialty Co., Chicago, Ill.	15
DeVilbiss Manufacturing Co., Toledo, Ohio	53
Dry Milk Company, New York, N. Y.	13
Foregger Company, New York, N. Y.	18
Gilliland Laboratories, Marietta, Pa.	23
Hanovia Chemical and Manufacturing Company, Newark, N. J.	25
Heidbrink Company, Minneapolis, Minn.	54
Horlick's Malted Milk Company, Racine, Wis.	2
Hynson, Westcott & Dunning, Baltimore, Md.	7- 8
Interpreter Publishing Co., Washington, D. C.	57-58
Johnson, Mead & Co., Evansville, Ind.	42-43
Kloman Instrument Co., Washington, D. C.	59-60
Kolynos Company, New Haven, Conn.	5



*Kronenberg X-Ray and Supply Co., Baltimore, Maryland 68
Loboratory Products Co., Cleveland, Ohio 21
Lea & Febiger, Philadelphia, Pa. 12
Lippincott, J. B. Company, Philadelphia, Pa. 9-10
Majors, J. A. Co., New Orleans, La. 35
Maltbie Chemical Company, Newark, N. J. 11
Mellins Food Company, Boston, Mass. 28-29
*Merrell-Soule Co., Syracuse, N. Y. 67
Metz, H. A. Laboratories, Inc., New York, N. Y. 36
Meyrowitz, E. B., Inc., New York, N. Y. 3- 4
Mosby, C. V. Company, St. Louis, Mo. 27
Pelton & Crane Company, Detroit, Mich. 62
Powers & Anderson, Inc., Richmond, Va. 16-17
Prior, W. F. Company, Hagerstown, Md. 38
Radium Chemical Co., Pittsburgh, Pa 40
Sanborn Company, Boston, Mass. 44-45
Sherman, G. H., Detroit, Mich 51
Spencer Lens Company, Buffalo, N. Y. 39
Squibb, E. R. & Son Co., New York, N. Y. 47-48
Taylor Instrument Companies, Rochester, N. Y. 19-20
Thompson-Plaster X-Ray Co., Leesburg, Va 52
Tieman, George & Co., New York, N. Y. 24
Toledo Technical Appliance Co., Toledo, Ohio 46
United States Radium Corporation, New York, N. Y. 30
Victor X-Ray Corporation, Chicago, Ill. 33-34
Wood, Wm. & Co., New York, N. Y. 64
Wilmot Castle Company, Rochester, N. Y. 6
Wocher, Max & Son Co., Cincinnati, Ohio 22

*Spaces 67 and 68 are in the large room on right marked "Scientific Exhibits."

HOTELS

Washington has many splendid hotels and all who plan to attend the meeting may be assured of comfortable accommodations. We give below the names of the headquarters hotels, their rates and the sections that meet in those hotels, also names and rates of some other first-class hotels, approved by the Hotel Committee. Make your reservation direct with the hotel. But if you do not get a satisfactory reservation with the hotel, it is requested that you write immediately to Dr. Noble P. Barnes, Arlington Hotel, Washington, who is Chairman of the Hotel Committee, and he and his Committee will take great pleasure in seeing that comfortable accommodations are reserved in a first-class hotel.

NEW WILLARD HOTEL, 14th St. and Penn. Ave.
Single, without bath, $3; double, $5.
Single, with bath, $5, $6, $7; double, $7, $8, $9
General Hotel Headquarters
Scientific and Commercial Exhibits
Section on Medicine
Southern Gastro-Enterological Association
Section on Pathology
Conference on Medical Education

WASHINGTON HOTEL, 15th St. and Penn. Ave.
Single, with bath, $5, $6, $7; double, $8, $10, $12
Section on Pediatrics
Section on Obstetrics
Section on Eye, Ear, Nose and Throat
Section on Radiology
Section on Dermatology and Syphilology

RALEIGH HOTEL, 12th St. and Pennsylvania Ave.
Single, without bath, $3, $4; double, $4, $5, $6
Single, with bath, $4, $5, $6, $7; double, $5, $6, $7, $8
Section on Surgery
Southern States Ass'n. of Railway Surgeons
Section on Bone and Joint Surgery

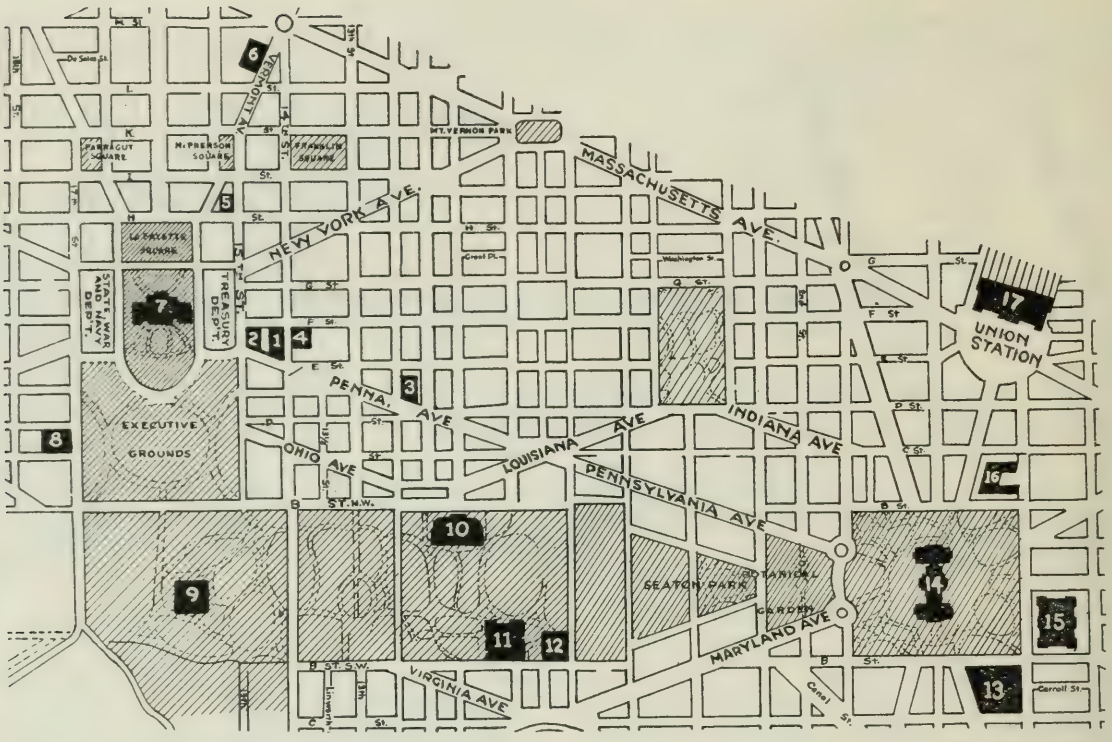
SHOREHAM HOTEL, 15th and H Sts.
Single, without bath, $3, $4; double, $6
Single, with bath, $5, $6, $7; double, $7, $8, $10
Section on Urology
Section on Neurology and Psychiatry

NEW EBBITT HOTEL, 14th and F Sts.
Single, without bath, $2.50; double, $4
Single, with bath, $3.50; double, $6
Section on Public Health
National Malaria Committee
Conference of Southern States Statisticians

BURLINGTON HOTEL, 1120 Vermont Ave.
Single, with bath, $3.50, $4, $4.50; double, $5, $6, $7
Southern Association of Anesthetists

OTHER WASHINGTON HOTELS
(Approved by Local Hotel Committee)

Arlington Hotel, 1025 Vermont Ave.
Single, with bath, $5, $6; double, $7, $8
Franklin Square Hotel, 14th and K Sts.
Single, without bath, $2.50; double, $4
Single, with bath, $4; double, $5, $6
Gordon Hotel, 16th and I Sts.
Single, without bath, $3; double, $5
Single, with bath, $5; double, $7
Harrington Hotel, 11th and E Sts.
Single, without bath, $3; double, $4
Single, with bath, $4; double, $5, $6, $7
Hamilton Hotel, 14th and K Sts.
Single, with bath, $5, $6; double, $7, $8
Lafayette Hotel, 16th and I Sts.
Single, with bath, $4, $5; double, $6, $7, $8
Lee Hotel, 15th and L Sts.
Single, with bath, $4, $5, $6; double, $6, $7, $8
Martinique Hotel, 16th and M Sts.
Single, with bath, $4, $5; double, $7, $8
Powhatan Hotel, 18th St. and Pennsylvania Ave.
Single, without bath, $3, $3.50; double, $5
Single, with bath, $4, $4.50, $5; double, $5.50, $6, $7, $8



STREET MAP OF WASHINGTON

1. New Willard Hotel
   - Registration, Scientific and Commercial Exhibits
   - Section on Medicine
   - Southern Gastro-Enterological Association
   - Section on Pathology
   - Conference on Medical Education
2. Washington Hotel
   - Section on Pediatrics
   - Section on Obstetrics
   - Section on Eye, Ear, Nose and Throat
   - Section on Radiology
   - Section on Dermatology and Syphilology
   - Second General Session (Thursday afternoon)
3. Raleigh Hotel
   - Section on Surgery
   - Southern States Association of Railway Surgeons
   - Section on Bone and Joint Surgery
4. New Ebbitt Hotel
   - Section on Public Health
   - National Malaria Committee
   - Conference of Southern States Statisticians
5. Shoreham Hotel
   - Section on Urology
   - Section on Neurology and Psychiatry
6. Burlington Hotel
   - Southern Association of Anesthetists
7. The White House
8. Continental Memorial Hall (D.A.R. Building)
   - First General Session (Monday night)
9. Washington Monument
10. New National Museum
    - Reception Tuesday night
11. Arst and Industries Building
    - Permanent Public Health Exhibit
12. Army Medical Museum and Library
13. House Office Building
14. The Capitol
15. Library of Congress
16. Senate Office Building
17. Union Station

Book Reviews

(Continued from page 889)

nity, and the students of immunity could well study the immunity derived from such bactericidal action, especially with reference to pulmonary infections.

Dr. Paget in this book is placing before the world a rather novel method of treating tuberculosis. His reasoning in many places is open to objections, and his conclusions are hastily arrived at. It has not been the experience of the medical profession of America that milk has the many objections as a food, as stated by Dr. Paget. We, in this country, have come to rely upon milk as the one best food for the disease.

Dr. Paget does not show what the final results of his treatment are, inasmuch as one of the recognized characteristics of tuberculosis is its tendency to relapse. The length of time, three or four months, as given by Dr. Paget in his observations, is far too short a period to judge of the results obtained in any method of treatment of this disease. Nothing less than several years could reasonably be accepted.

Dr. Paget is to be congratulated upon the excellent manner in which he handles the statistics of the disease. These in themselves show the great curability of the disease with, without or despite treatment.

Modern Aspects of the Circulation in Health and Disease. By Carl J. Wiggers, M.D., Professor of Physiology, School of Medicine, Western Reserve University, Cleveland, Ohio. 204 engravings. 662 pages. Second Edition, Thoroughly Revised. Philadelphia and New York: Lea & Febiger, 1923. Cloth, $7.50.

The book takes up the circulation and applies known laws of physics to explain the conditions found in health and disease as far as possible. It is based upon a broad knowledge of the literature and upon research work in this part of physiology and pathology.

Graphic methods are described in great detail, and as in the former edition the author stresses the very great importance of the Frank capsule in investigation, both experimental and clinical.

The author assumes that his reader is conversant with physics and mathematics as taught in colleges, and without this knowledge the book would be of limited use to physicians.

The new sections which have been added to the previous edition are: The Efficiency and Adaptability of the Heart, The Vascular Control of the Circulation, The Principles and Practice of Optical Registration, The Functional Disturbances of the Heart, and The Dynamic Consequences of Arrhythmias and Chronic Heart Disease.

The first edition of this work was favorably received by the profession, and this new edition should meet with the even greater approval of those who care to go into the newer aspects of the circulation.

Southern Medical News

ALABAMA

Southeastern Alabama Counties Medical Association, under the presidency of Dr. James M. Watkins, Troy, held a joint annual meeting and picnic at Flemming's Mill August 21. The counties represented were: Barbour, Bullock, Coffee, Covington, Crenshaw, Dale, Henry, Geneva, Houston, Montgomery and Pike.

In a bill introduced in the Senate September 6, it is sought to abolish the antituberculosis commission created in 1915 and entailing an annual appropriation of $6000.

It has been announced that the new $100,000 Walker County Hospital, Jasper, would be opened about October 10. Miss MacLean, Superintendent of the Fraternal Hospital, Birmingham, has been appointed Superintendent.

On August 22 the house passed a bill to appropriate $50,000 for the child welfare department, with an additional $50,000 when, in the judgment of the Governor, conditions warrant it, and an annual appropriation of $100,000 after the first year's appropriation.

A committee composed of Dr. Seale Harris, Dr. Benjamin L. Wyman, Dr. D. F. Talley, Dr. Wm. C. Gewin, Dr. Joseph D. Heacock and others was appointed at a recent meeting of the Jefferson County Medical Society to work in the interest of a bill proposed to amend the State health laws, so that county boards of health have authority to arrange their own budgets.

Dr. Frank Hausman, Tuscaloosa, Superintendent of the Druid City Hospital, has resigned.

ARKANSAS

The forty-eight annual meeting of the Mississippi Valley Medical Association was held at Hot Springs October 9-11. A tour of the Government reservation was made.

Deaths

Dr. W. P. Dabney, Combs, aged 83, died recently from senility.

DISTRICT OF COLUMBIA

A new permanent health exhibit will be established at the Smithsonian Institution, Washington, showing methods used in teaching child hygiene. It is in four sections and is to be conducted by the American Child Health Association.

Dr. William C. Fowler, Health Officer of the District of Columbia, is advocating a clinic where, in certain instances, persons arrested may be examined as to their physical and mental condition. An initial appropriation of $15,000 will be needed to open the clinic. The plan has been generally endorsed in Washington.

The Federal Children's Bureau called a conference of child welfare workers and directors of child hygiene bureaus in Washington September 19-21. Representatives from forty-four states attended the session.

Dr. Frederick C. Greaves, Lieutenant, M.C., U. S. Navy, Washington, and Miss Rose Anclee Torbol, Duluth, Minn., were married August 11.

Deaths

Dr. James Robb Church, Washington, aged 57, died August 29.

Dr. Alexander Dwight Parce, Washington, aged 43, died at the Walter Reed General Hospital August 21.

FLORIDA

Contracts have been let for the new $75,000 addition to the City Hospital, St. Petersburg.

The two general medical wards of the U. S. Veterans' Bureau Hospital No. 63, Lake City, have been completed and equipped. They have a capacity for 300 patients. Major R. W. Brown is commanding officer; Major J. H. Dyer will have charge of the surgical service, and Major Herbert Caldwell will serve on the general medical service.

The Pinellas County Medical Society, at a meeting held in St. Petersburg October 12, elected Dr. O. M. Knox, President; Drs. T. R. Griffiin and C. A. Williams, Vice-Presidents; Dr. O. O. Feaster, Secretary; Dr. L. A. Wylie, Treasurer; Dr. J. D. Peabody, Censor, 1926.

Dr. Joseph B. Farrior has been elected Chairman of the Bureau of Public Health and Hospitals of the Tampa Board of Trade.

Hillsboro County Medical Society, on July 12, held its annual picnic at Lake Stemper, near Tampa.

Columbia County Medical Society is holding two meetings a month in conjunction with the staff of the U. S. Veterans' Hospital No. 62, Lake City. At each meeting two clinical cases are presented, one by a representative of the Government institution and one by a civilian practitioner.

The new Mercy Hospital for colored people, St. Petersburg, has been completed.

Dr. Sherrod Austell Lindsey and Miss Irene Hammett, both of Fort Meade, were married July 18.

Deaths

Dr. J. Z. Cravey, Pensacola, aged 75, died September 13 in a local hospital.

Dr. Mary Ann Willard, Mannville, aged 81, died July 25 from pulmonary tuberculosis.

Dr. Martha A. Bonnell, Bradentown, aged 72, died August 23 from gangrene of the intestine.

Dr. William Franklin Ernest, Miami, aged 65, died August 29 from cerebral hemorrhage.

GEORGIA

The Medical Association of the Eighth Congressional District has elected Dr. W. H. Calaway, Athens, President; Dr. W. C. McCleary, Madison, Vice-President; Dr. D. M. Carter, Madison, Secretary-Treasurer.

The Association of County Physicians of the State of Georgia was recently organized for the purpose of bringing about a closer relationship between the county commissioners of the State and the county physicians.

The Miller tobacco tax act, levying a 10 per cent sales tax on cigars and tobacco, has been signed by Governor Walker. It is effective January 1, 1924, and will raise an estimated revenue of $2,500,000 annually, the first $500,000 of which will be used for the development of the State Tuberculosis Sanatorium, Alto, and the balance for the payment of amounts due Confederate pensioners.

Dr. Lamartine G. Hardman, Commerce, has presented the Board of Trustees of the University of Georgia Medical Department, Augusta, with a large-sized portrait of Dr. E. F. Starr, formerly of White County, who, it is stated, performed the first supra-

(Continued on page 914)

CLASSIFIED ADVERTISEMENTS

HOSPITAL REPORTS—Medical, surgical, and operation reports criticized and corrected. Send me your last year's report or your proof sheets and I will red-pencil and correct them so that you may raise your standard for this year to meet more nearly the requirements of the American College of Surgeons. Charge $10. Enclose check with report. S. T. Barteau, medical statistician, Bellevue Hospital, New York.

WANTED—Two internes (graduates of Class A Schools) at New York Polyclinic Hospital, New York City postgraduate medical institution of 350 beds, offering a general service in surgery, medicine and specialties for one year or more. Apply Superintendent, New York Polyclinic Hospital.

FOR SALE—Complete set of plans and specifications for construction of three-story and basement brick (private surgical) hospital building containing thirty-seven rooms and nine bath rooms, electric elevator, dumb waiter, fire-proof stairway, tile roof and up to date in every respect. Reason for not using plans: decided to specialize and moved to a larger city. Copy of blue prints can be seen on request. Plans and specifications cost seventeen hundred and fifty dollars. Best offer gets them. Dr. R. T. Ferguson, Professional Bldg., Charlotte, N. C.

FOR SALE—Eye, ear, nose and throat practice better than $7,000 annually—Leesburg, Virginia. Office thoroughly equipped; every type instrument necessary; hospital advantages; lovely section of country. Apply to Mrs. J. W. Marshall, Leesburg, Virginia.

pubic operation to remove a stone from the bladder of a man. Dr. Starr's daughter preserved the stone and it was presented to the University with the portrait.

The National Child Health Association has selected Athens for a five-year child health demonstration. The Commonwealth Fund has set aside $250,000 for conducting this center, which will be established in about a month.

LaGrange Medical Society has elected Dr. Emory R. Park, President; Dr. R. S. O'Neal, Vice-President; Dr. Emery C. Herman, Secretary-Treasurer.

Dr. Linton Gerdine has been elected President of the Board of Health of Athens, succeeding Dr. J. C. McKinney.

At the meeting of the State Board of Medical Examiners, held October 10, the following officers were elected: Dr. J. W. Palmer, Ailey, President; Dr. N. Peterson, Tifton, Vice-President; Dr. C. T. Nolan, Marietta, Secretary-Treasurer. Dr. Burr T. Wise, Plains, was appointed a member of the Board to succeed Dr. M. F. Carson, Griffin.

The Macon Graduate Clinic will be held in Macon November 5-10. Dr. C. H. Richardson, as Chairman, and Dr. A. R. Rozar, Dr. J. C. Anderson and Dr. G. Y. Massenburg will draw plans by which the Post-Graduate Clinic will run.

Dr. Dunbar Roy, Atlanta, has given $1000 to the "Founders' Roll" of the Stone Mountain Confederate Memorial in honor of his father, the late Dr. Gustavus Garnett Roy.

The family of Dr. E. L. Connally has made a gift of $1000 to the "Founders' Roll" of the Stone Mountain Confederate Monumental Association in honor of Dr. Connally.

Dr. Benjamin F. Bond, Americus, has resigned as County Health Commissioner of Sumter County, and has accepted a position at the United States Marine Hospital, Savannah.

Dr. James B. Wright, Augusta, has been appointed Health Officer at Black Mountain.

The Sycamore Hospital, Sycamore, has been reorganized under the name of Turner County Hospital. The building will be enlarged and newly equipped.

The U. S. Government trachoma hospital, Pelham, closed July 20, after giving free treatment to the people of that section for about two months. More than a hundred cases of trachoma were treated.

Dr. Theodore Toepel, of Atlanta, has been elected President of the Georgia State Council of Health.

Dr. Wilmot Shipp Littlejohn, Tugalo, and Miss Mary Rose Brown, Americus, were married August 22.

Dr. Alfred Harvey Black, Thomaston, and Mrs. Obie McKenzie Duncan, Montezuma, were married recently.

Dr. Edward W. Watkins, Jr., Ellijay, and Miss Bessie McLeod, Quitman, were married August 8.

Dr. Davis W. Register and Miss Margaret H. Vignaux, both of Atlanta, were married August 25.

Deaths

Dr. Forrest H. Phillips, Harlem, aged 57, died August 23 following a long illness.

Dr. William W. Rich, Center, aged 79, died August 6 following a long illness.

Dr. Robert N. Hogg, West Point, aged 54, died suddenly August 20.

Dr. Edward C. Bruce, Brunswick, aged 46, died July 22 after a long illness.

KENTUCKY

At the seventy-third annual meeting of the Kentucky State Medical Association, held in Crab Orchard September 17-20, the following officers were elected: Dr. Frank Boyd, Paducah, President; Dr. John Rice Cowan, Danville, President-elect; Drs. Chauncey W. Dowden, Louisville, John G. Foley, Pineville, and Edmund G. Thomas, Benton, Vice-Presidents; Dr. Arthur T. McCormack, Louisville, and Dr. W. B. McClure, Lexington, were re-elected to serve a term of five years each as Secretary and Treasurer, respectively.

Plans are being made to erect a new hospital and cottage building for the Kentucky Children's Home, Lyndon. It will cost approximately a half million dollars.

It was announced that a "Milk for Health Week" would be observed at Hopkinsville, beginning October 22, to encourage the feeding of milk to children. Various city organizations will cooperate with the Fed-

(Continued on page 40)

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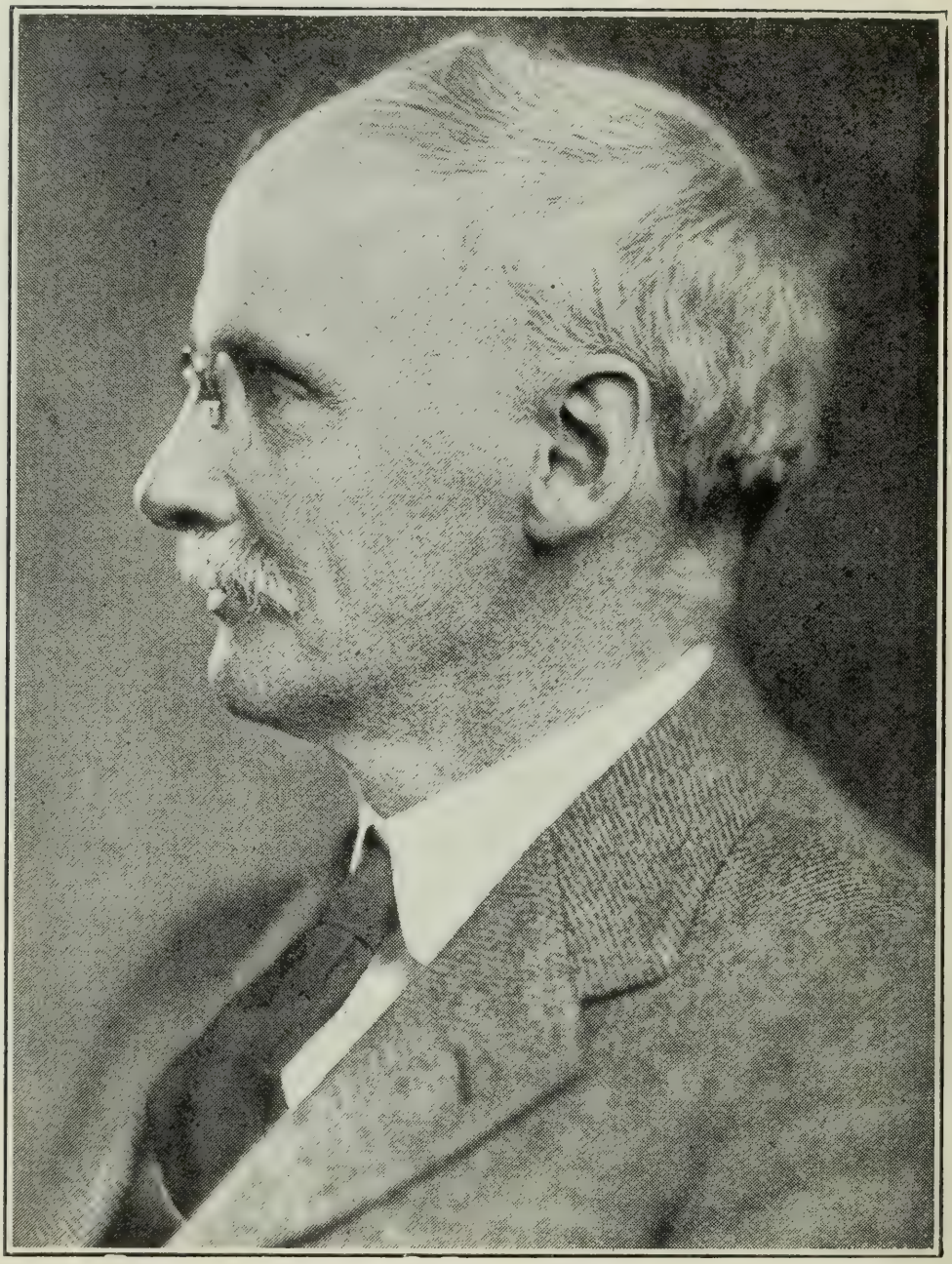

DR. CHAS. L. MINOR

ASHEVILLE, N. C.

PRESIDENT SOUTHERN MEDICAL ASSOCIATION, 1923-1924

SOUTHERN MEDICAL JOURNAL
JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION
PUBLISHED MONTHLY BY THE SOUTHERN MEDICAL ASSOCIATION AT BIRMINGHAM, ALA.

Volume XVI DECEMBER 1923 Number 12

MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

THE NEWER ASPECTS OF NUTRITION*

BY JAMES S. MCLESTER, M.D.,
Birmingham, Ala.

The science of nutrition has in recent years given us many new and hitherto undreamed of facts. As men interested in the prevention and treatment of disease, it behooves us to fasten upon and make effective use of these newly discovered principles. I shall make a brief survey of the newer advances in the science of nutrition, first in their relation to the maintenance of health and then in their bearing upon the treatment of disease.

How much food does a healthy man require? And of what kinds? Both questions merit discussion. Like any other engine, the human body consumes fuel and liberates energy. The food necessary for the maintenance of life is that which on oxidation will supply to this engine the requisite energy and which in addition will replace the wear and tear of the machinery. This is all susceptible of measurement. We can accurately gauge the amount of oxygen which a man consumes and measure the carbon dioxid and nitrogen which he excretes, and from this we are able to compute the total amount of material which has been burned in the various physiologic processes, as well as the relative amounts of carbohydrates, fats, and protein, thus destroyed. Knowing these figures, we draw conclusions as to the amount and kind of food which a man must eat in order to protect his own tissues and meet his requirements for energy.

For the average man it is universally agreed that this necessitates a daily intake of 2500 to 3500 calories, the exact amount depending upon his size and the nature of his occupation. The diet should provide sufficient carbohydrates to yield most of the heat and other energy, then in addition a certain amount of fat, and invariably enough proteins to at least replace that destroyed within the body—the so-called wear and tear quota.

This protein requirement has for years been a bone of contention. The pioneer physiologist, Voit, after observing the food actually consumed by a large part of the population, concluded that the average individual requires daily about 118 grams of protein. This estimate was for a long time universally accepted. Then Chittenden, who believed that his own physical ailments were the result of intestinal putrefaction, studied upon himself and a number of students the influence of a low protein intake. He concluded that unusual mental and physical vigor could be obtained with a diet which provides only one-third of the protein ordinarily advised, about forty grams. Other American investigators became convinced of the accuracy of Chittenden's observations and were converted to the low protein theory. Re-

*Jerome Cochran Lecture, delivered before the Alabama State Medical Association, Mobile, April, 1923.

cently, however, McCollum has pointed to a fallacy in the reasoning of Chittenden and has dealt his proposed diet a severe blow. This investigator has observed that for a limited period mice can live in apparent health and vigor upon a very low protein intake, but that upon this minimal diet the mouse eventually sickens, soon ages, and dies early. If we bear in mind that the normal span of life of a mouse is only 36 months while that of man is twenty times as long, we must agree that McCollum is right when he says that the nine months' period of Chittenden's observations upon man was entirely too short. It is evident that the reaction of a man to a given diet during a brief fraction of his life can be no criterion of what his response would be to such a diet during his entire life; that he may live nine months or even longer upon a low protein intake and exhibit normal vigor, only a little later, like the mouse, to age prematurely and succumb. The early German clinicians understood this when they wrote of a "luxury" protein, an amount which the man must have in excess of his calculated minimum if he would enjoy full health and vigor. Meltzer also saw it when he reminded us of the factor of safety which an engineer computes in building a bridge and warned us that in diet a similar factor of safety is essential.

It seems fair, then, to conclude that the older estimates of man's protein needs were correct, and that to enjoy sustained vigor and to experience his normal expectancy man must eat a liberal quantity of good protein. By liberal is meant an amount well in excess of his theoretic needs, such an amount as the experience of the race has shown to be advisable, and by good is meant a protein of high biologic value.

This biologic value of a protein requires comment. The proteins which we eat consist of chains of amino-acids, and these same amino-acids in varying combinations constitute the building stones of our own tissues. The essential difference in proteins is in the variety and arrangement of the constituent amino-acids. If a food protein furnishes in full measure all those amino-acids which unite to construct our own tissues, it is of high biologic value. If, however, it fails to supply any essential amino-acid or indeed if it is merely poor in such an amino-acid, this protein is unsatisfactory as a food, and thus is of low biologic value. The proteins of milk, meat, and eggs are of high biologic value, and therefore from a physiological standpoint are economical foodstuffs. On the other hand, the proteins of the cereal grains and vegetables are of distinctly lower biologic value and should not be depended upon as the sole protein food. Thus we see that man must not only eat a sufficient amount of protein, but in addition he must give attention to its kind and its source.

A study of the sources of all classes of food, protein, carbohydrate, fat, and mineral, has revealed surprising facts. It has been found that when these four foodstuffs are purified and separated from the substances which accompany them in nature they are incapable of sustaining life. Something else is needful. The animal must receive in his food a small but unfailing supply of those vitally important food factors called vitamins. The need for these was first discovered when it was found that experimental young animals could not be reared upon purified foodstuffs, such as starch, lard, purified casein and mineral matter, even though these were provided in ideal amounts. Upon such a diet the young animal failed to grow and the adult soon sickened and died. There are missing from this purified diet at least three essential substances, the three vitamins. While we do not know the exact chemical nature of these bodies, we are thoroughly familiar with their physiological influences, their sources in nature, and the diseases to which they are related.

Each of the known vitamins, called A, B, and C, performs important functions in promoting growth or in maintaining health, and the lack of any one of these will produce characteristic illness. The fat-soluble vitamin A is essential to growth. Without it the young animal is retarded in his development and is not permitted to reach maturity. The absence of this vitamin from the diet will produce also a characteristic eye disease known as xerophthalmia. If to the food of an ani-

mal handicapped by this deficiency there is added a sufficient amount of some food containing vitamin A, growth is promptly resumed, or if he has ophthalmia, the disease disappears almost like magic. This vitamin is present in abundance in milk, butter, egg yolk, and the leafy portion of vegetables, such as spinach, lettuce, and cabbage.

Concerning milk, however, it must be borne in mind that the nature of the cow's food determines the richness of her milk in vitamins. She cannot manufacture vitamins, but must secure these from silage and green pastures. Likewise, the nursing mother, to meet the vitamin needs of her infant, must eat an abundance of the leafy portion of vegetables and other foods rich in vitamins.

Of other diseases produced by vitamin deficiency, the earliest known was beriberi, a polyneuritis which occurs most often among those people who live upon a diet of polished rice, and which results from lack of vitamin B. While this disease in its acute form will never be of more than theoretic interest to you and me, there are nevertheless certain vague borderline kindred disturbances which are of genuine interest. We constantly encounter and fail to recognize these milder forms of disease which result from chronic deficiency of vitamin B.

This vitamin which is contained in the outer covering of the grain is lost in the process of milling, therefore the person who eats bolted flour or other milled grains must compensate for this loss by including in his diet certain other foods which are rich in vitamin B, such as milk, tomatoes, potatoes, cabbage, spinach and beans. The great value of the tomato lies in its richness in this factor. Muscle meats are poor in vitamin B, but the glandular organs, liver, kidney and pancreas, are relatively rich.

Lack of the third of these interesting food factors, vitamin C, produces scurvy, a disease which flourished on the old-time sailing vessels, but which in its typical form today is rare. It is, however, frequently encountered in mild atypical types such as are seen in occasional epidemics of scurvy among infants. Among adults, malnutrition, anemia, pyorrhea and numerous vague digestive disorders result from lack of this vitamin. If man would escape these ills he should eat fresh vegetables such as cabbage, turnips, lettuce, watercress, and tomatoes, and such fruits as oranges, lemons and raspberries.

In this group of diseases we should include pellagra, for whatever its immediate cause, it must be admitted that in ultimate etiology pellagra is a genuine deficiency disease. It would appear from recent researches that it results from a lack of certain amino-acids and that it can be prevented or cured by a diet which contains an abundance of good protein.

Rickets is another deficiency disease with which we are intimately concerned, for it is said that at least 90 per cent of American children suffer in some measure from this developmental bone disorder. In the treatment of this disease our old-time faith in the potency of codliver oil is borne out by its marvelously curative properties. Since rickets is believed to result from a disturbance in the metabolism of phosphorus and calcium, milk, because of its richness in the latter element, is seen again to be a food of pre-eminent value.

The deficiency diseases of which I have just spoken, with the exception of pellagra, are seldom seen by us in their typical forms, but in atypical forms they are frequently encountered and they constitute some of our most baffling problems. Consider the alarming increase of dental disease among children. The slogan that a clean tooth never decays is false, for we now know that the fate of the tooth is largely determined before its eruption. During intra-uterine life and soon after birth the protective membrane of the tooth is developed and at this time the integrity of this membrane and with it the future character of the tooth is determined by the vitamin content of the mother's food. It has been found in experimental animals that, by variation in diet, the character of the suckling's teeth can be determined at will. If the mother's food is deficient in vitamin C the teeth of the young animal will be badly formed and will show early decay, while a well balanced diet with an adequate supply of vitamins for the mother will insure to the offspring teeth

of normal contour and integrity. How can we explain the pronounced difference in the teeth of white and negro children, unless it be due to differences in the diet of the mother? Of several thousand school children recently examined by me the white children almost universally showed dental caries and malformations, while those of the negro race in overwhelming majority presented teeth of beautiful whiteness and perfect regularity. To 90 per cent of the latter the tooth brush is an unknown luxury. The explanation of this shameful difference lies, I believe, in the fact that the negro woman eats more "greens" and nurses her child more universally and longer than does the white mother. Great emphasis should be laid upon the value to the offspring of a generous supply of vitamins in the food of the mother.

Other results of chronic vitamin deficiency are those many vague insidious conditions of ill health which destroy the happiness of the patient and baffle the wits of the physician. Long-continued low grade deficiency in vitamin B will lead to so-called functional nervous disorders. Many patients suffering from this type of deficiency are called neurasthenics; others because of the various forms of neuritis from which they suffer are forced to sacrifice their teeth upon the altar of focal infection. In addition, since lack of this vitamin profoundly influences the muscular control, secretory function, and assimilative powers of the intestine, we find among these patients many and various digestive disorders. These sufferers who complain of vague gastro-intestinal symptoms often get little sympathy because they are classed as "gastro-intestinal neurasthenics." At other times they are treated for "biliousness," gastric catarrh, gastric ulcer, various intestinal diseases, and even (save the mark!) for visceroptosis. The clinical picture may be complicated still further by a diet lacking in any two or even all three vitamins. In fact, such combined food deficiency is probably the rule.

To prevent these deficiency diseases we should eat more of what McCollum calls the protective foods—protective because they supply essentials often missing from the diet and therefore protect against nutritional failure. These foods are milk, eggs, and the leafy portion of green vegetables. Chief among them is milk. I should like to digress a moment to speak of the great value of milk. The high biologic value of its proteins, its abundance in all three classes of foods, its supply of calcium, and its richness in vitamins all combine to make milk our most valuable food. Everyone recognizes that it is essential to the proper development of the child, but few people realize the great importance of milk to the entire population. Attention has been called to the vigor and physical beauty of those pastoral peoples whose diet consists in large part of milk or milk products. Compare the wonderfully fine physique and intellectual qualities of the Arab, for instance, with the poor development of other African or Asiatic peoples. Witness the robust appearance and great vigor of the milk-drinking Swiss mountaineer and compare him with the cereal-eating inhabitant of southern Italy, or, sad to say, with certain groups of our own people. This physical superiority of the Swiss and the Arab cannot be explained by climate, for, while the one enjoys a cold, invigorating climate, the other lives in a hot, dry, inhospitable land. Neither climate permits of successful farming and both peoples must live upon the products of grazing herds. The consumption of milk and milk products, therefore, is the thing in common between these two peoples of surpassing physique. If our own people would devote a liberal part of their acres to pasturage for cows and would learn to drink milk, they would be richer not only in health and happiness, but in material resources as well.

Milk has brought to a physician of whom I have heard a widespread reputation. Patients flock to him from afar, because, without any well planned effort at diagnosis, he puts everyone on an abundant milk diet. He has unwittingly stumbled upon the best method of relieving vitamin and other food deficiencies, and thus has benefited great numbers of the poor unfortunates who go to him. If he would add to his diet lettuce and spinach the treatment would be ideal.

What kind of food, then, must man eat in order to enjoy robust health and to avoid the ills of vitamin deficiency? McCollum's answer to this question is something like this: He should each day drink one quart of milk and should eat two liberal helpings of the leafy portion of green vegetables, and two salads, such as lettuce, watercress, or tomatoes. He should eat one small helping of any meat and perhaps two eggs. To this he may add anything else within reason which his appetite demands, including a liberal supply of bread, butter, fruits and various vegetables. If he will do this, the state of his nutrition will not suffer and he will escape many forms of nutritional failure.

The advances in the science of nutrition have not been limited to the maintenance of health, for in recent years we have come also to a much clearer understanding of the nutritional needs of the sick. This is particularly true, for example, in typhoid fever, nephritis, diabetes, cardiac disease, obesity, and certain digestive disorders.

I hesitate to include here typhoid fever both because the high caloric diet is today no longer new, and because in Alabama this disease is of constantly diminishing importance. Yet in the feeding of the typhoid fever patient many physicians still exhibit an old-time conservatism which is always unnecessary and is often harmful. The basal metabolism of fever is greatly increased; the patient rapidly oxidizes his food and if sufficient food is not available he then burns his own tissues. This abnormal destruction of the patient's own tissues leads to the production of poisonous waste products with resulting acidosis and the condition which we term toxemia. This so-called toxemia will be avoided if the patient is given sufficient food, and then, being well nourished, he is much better able to cope with his infecting organism.

This more liberal diet in typhoid fever was formerly feared because of the assumption that solid particles of food would irritate the intestinal ulcers. Since, however, all reasonable food is reduced to a fluid state before it reaches the region of the ulcer, this fear is groundless. Contrary to the older beliefs, the gastro-intestinal tract in typhoid fever is well able, without danger of injury, to digest and assimilate the required amount of food.

We now give our typhoid fever patients liberal amounts of milk, soft eggs, cereals with cream, milk toast, stewed fruits, fruit juices, lactose lemonade, and like articles. The effort here is to include in the diet large amounts of carbohydrates, and to reach a calorific value well beyond 3000. Milk sugar is particularly valuable for this purpose because, while of equal caloric value with cane sugar, it is not so sweet and therefore can be taken in large amounts. Upon this high calorie diet patients are not so ill as when they are starved, their strength is retained, evidences of profound toxemia are missing, diarrhea is less frequent, tympanitis is less distressing, and the duration of the illness is shorter. Any one who has used both methods of feeding in typhoid fever will say that the high calorie diet is infinitely the better.

Another disease in which starvation is often carried to the point of harming the patient is chronic nephritis. We must remember that this is a disease not of weeks or months, but of years, and that it is necessary to provide a diet which will not only spare the kidney but which will maintain the patient for many years in the highest degree of bodily and mental vigor. The patient must meet his needs for heat and muscular energy by the oxidation of a definite amount of material, and if this is not furnished in adequate amount in his food he inevitably burns his own tissues.

As we have seen, a man say of 150 pounds and sedentary habits must secure from his food a minimum of 2500 calories daily, which food should consist largely of carbohydrates and fats, but in addition of an absolutely essential quota of protein. A diet of lower value or lacking in protein when long continued brings eventual disaster.

Experience has shown that the diet of the chronic nephritic should contain daily at least 60 grams of protein. Slightly more than this is often advisable. Concerning the metabolic end-products which reach the kidney, the actual source of the protein, whether it comes from milk, meat or wheat, is all the same. It is important, however, that the protein be of high bio-

logic value; for the proteins of low biologic value must be eaten in larger amounts and thus will throw increased burden upon the kidney. Because of their higher quality, therefore, milk, meat and eggs are to be preferred as sources of protein.

Thus we conclude that the diet of a patient with chronic nephritis should provide sufficient calories for his physiologic needs; and that in addition to these foods the diet should also contain each day a certain amount of milk and one or two eggs, to which should be added at frequent intervals, say three times weekly, a small helping of meat.

This unanimity of opinion which we have seen in nephritis does not extend to diabetes. The fasting treatment of this disease, first popularized by Allen, represented a distinct advance, but today we are not starving diabetics so universally or to the extreme degree that was originally proposed. Woodyatt was the first clinician to emphasize the fact that starvation does not relieve the burden upon metabolism as at first glance might appear. Even the starving man, as has been repeatedly emphasized, generates heat and releases muscular energy, and for this he must metabolize his own tissues. The amounts of fat and proteins thus destroyed during starvation are not subject to control, and the resulting abnormal metabolism may lead to dangerous consequences. As far as the burden thrown upon metabolism is concerned, it matters little whether the material oxidized represents food intake or the destruction of the patient's own tissues, but it is clearly more rational to give by mouth a carefully selected diet which will accurately meet the patient's metabolic needs rather than permit him to oxidize an uncontrolled amount of his own fats and tissue protein. For instance, it has been shown by experiment that a well-nourished man weighing fifty kilograms while fasting will metabolize of his own tissues about 75 grams of protein and 125 grams of fat, thus liberating 1500 calories. Were this man given appropriate food by mouth, his own tissues would be spared and, through a carefully adjusted diet, he would receive, with less danger of acidosis, a greater number of calories.

This being true, why, asks Woodyatt, should we ever use complete fasting in diabetes? Why, for the purpose of rendering him sugar free, should we force a patient to draw upon his own stores of body fat and tissue protein, when this same fat can with advantage and with greater accuracy of dosage be given by mouth? This question of the amount of fat which the diabetic can take is now the subject of controversy.

Considerations such as these led Newburgh and Marsh to devise their low-protein-high-fat diet, with which they have achieved good results. On the other hand, Joslin advises a low-fat diet because he feels that large amounts of fat will lead to the excessive accumulation of fatty acids and eventually to diabetic coma. To place this question on a more scientific basis, Woodyatt devised certain formulae from which it is possible to calculate in any given case the patient's actual needs as to carbohydrates, proteins and fats, and to estimate the amount of fat which can be taken with safety. As he expresses it, the fats burn in the fire of the carbohydrates, and if there is insufficient carbohydrate the fire smokes. The fatty acids are likened to the smoke. The ratio of safety as worked out by Woodyatt shows that one gram of carbohydrate will permit the utilization of 1.5 grams of fat. If the amount of fat is kept well within this carbohydrate-fat ratio there will be no likelihood of acidosis and small danger of coma. All in all, it would appear that the advocates of high-fat-low-protein diet have upon their side the weight of evidence.

This is not the place to speak extensively, as I should like to do, of insulin, but no discussion of diabetes could be complete without some reference to Banting's wonderfully valuable discovery. This preparation, containing the internal secretion of the islands of Langerhans, enables the patient whose tolerance is low to metabolize an increased amount of carbohydrate and this in turn permits the safe utilization of more fat.

The improvement in the general physical condition and the restoration of the

sense of well being of the diabetics to whom I have given insulin has been most gratifying and encouraging. On several occasions we have been able by means of insulin injections and glucose administration to avert impending coma.

The great value of insulin, however, lies in this. It permits the pancreas to rest. The untreated diabetic grows gradually worse because the excess of unutilizable sugar circulating in his blood makes impossible demands upon the cells in the islands of Langerhans and therefore brings about their exhaustion and final degeneration. Supply artificially, as insulin does, enough ferment to take care of this sugar and the demand upon the cells lessens; they enjoy a period of rest, and then recuperation with restoration of function ensues. This is the important service accomplished by insulin. It should be emphasized that insulin alone will not cure diabetes, and that it can never take the place of intelligently planned dietary regulation. But it represents by long odds the greatest aid which has ever been devised in the treatment of this disease.

The importance of the diet in the treatment of cardiac diseases has never received full recognition. The fate of the man with an impaired heart depends entirely upon the ability of his myocardium to do its work. We can do little directly to help the myocardium, but we can by reducing the patient's weight effectively lessen its work and thus indirectly achieve benefit. It is purely a question of foot-pounds and we can reduce the pounds at will. Often the first indication in the treatment of chronic heart disease is to reduce the patient's weight, and this can be accomplished only by regulating his diet.

Dietary limitations are popular, for it is the fashion today to be thin, and there is an insistent demand upon physicians, especially from women, for advice as to reduction of weight. A rational diet with suitable exercise offers the only safe course, for the use of thyroid extract and anti-fat medicines is to an extreme degree dangerous. In the reduction cure, the patient must rigidly limit the total intake of all foods, and his slogan should be "Watch the calories." This can best be done, not by completely eliminating from the diet a few appetizing but supposedly fattening articles, but rather by reducing the total amount of all foods, especially those which lead to the deposition of fat. The patient should be told that he may eat small amounts of any reasonable food, but that the fats, particularly butter, cream, and oil dressings, should be taken only in extremely small amounts. Especial care should be taken to limit the amount of bread. While other starchy foods such as rice and potatoes should be rigidly controlled, the amount of bread should be reduced to a minimum. Often a satisfactory reduction can be accomplished merely by telling the patient to eat only half the amount of bread and butter to which he is accustomed. If these rules are observed and then the very important precaution is taken to see that the patient does not commit the folly of making up for his bread and butter restriction by increasing the amount of other articles of food, a safe reduction can fairly be expected.

That group of diseases which formerly enjoyed the greatest amount of dietetic attention merits, after all, only a small place in today's discussion. I refer to diseases of the gastro-intestinal tract. A large proportion of digestive troubles results from appendicitis, cholecystitis, diverticulitis, and other surgical diseases, and the diet naturally depends upon the nature of the operation. For similar reasons we can omit carcinoma from our discussion. This leaves us among the commoner diseases peptic ulcer, constipation, mucous colitis, the neuroses and the many other vague gastro-intestinal disturbances which have already been described as the accompaniment of faulty nutrition.

Sippy has devised and minutely outlined a diet for peptic ulcer which represents a distinct advance. The milk and cream mixture, of which he gives three ounces every hour, keeps some food in the stomach at all times and this, by neutralizing the acid, relieves the pain and permits healing.

We are learning to cure constipation by diet rather than to temporize with drugs. A soft, bulky bowel content which contains a great deal of non-absorbable cellulose furnishes the right sort of stimulus

to the intestinal wall and favors peristalsis. For this purpose large amounts of lettuce and other vegetables as well as fruits should be given. Bran, the identical bran which is fed to the cow, accomplishes the same purpose in a satisfactory manner. Two tablespoonfuls of bran eaten night and morning with cream and a little stewed fruit is an excellent corrective for constipation. Larger amounts may be taken if necessary. While not actually a food, agar belongs in the same class, and when taken in tablespoonful doses, or more, once or twice daily is very effective. The cure of obstinate constipation requires definite regularity of habits and great patience, but with long persistence and an intelligently planned diet success is the usual reward.

I mention in this connection mucous colitis because a concentrated diet which leaves little residue is so often, and always without benefit, prescribed in this disease. This is wrong, for a large soft bowel content is needed, and instead of a concentrated diet the patient should be given food adjusted to the cure of constipation. This will relieve the irritation of the colon and will benefit the mucous colitis.

We have already considered that numerous class of vague gastro-intestinal disorders which must be grouped together. The sufferers from these disorders often are badly sinned against in that much useless treatment is directed towards the stomach. Treat the patient and not his symptoms. The vast majority of these patients do not get enough to eat, and what food they do eat is not of the right kind. Ignore the frequent statement that milk cannot be taken. Give them large quantities of milk and insist that they eat eggs, lettuce, spinach and tomatoes. After a brief preparatory period add each day a liberal helping of meat, and then prescribe the further addition of other simple wholesome articles in amounts sufficient to give daily 3500 or 4000 calories. Do this, and many digestive disorders will disappear.

In conclusion, the great importance of the subject of nutrition, as McCollum reminds us, lies in the fact that faulty diet does not often produce sudden and graphic consequences. Its results are slow, insidious, and difficult of recognition. Nutritional faults gradually undermine the health of the individual and lead to physical and perhaps even mental inferiority. The poorly nourished man hurries through his span of life; passes quickly through each phase of his life cycle; ages prematurely; and dies early. At this time when serious minded men talk of the early decadence of our civilization, would it not be well to avail ourselves of those factors through which it is possible to improve the stamina of the individual and to make secure the future of the race? Chief among these is the proper selection of food.

THE BASAL METABOLIC RATE IN UNCINARIASIS*

By R. McBrayer, A.B., M.D.,
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During the last six months we have observed the basal metabolic rate, using a Tissot gasometer and Haldane gas analysis, in six cases of proved clinical hookworm disease. These cases (all adults) were sent to us because a diagnosis of probable pulmonary tuberculosis had been made. Two had no clinical tuberculosis or any evidence of any other disease except uncinariasis; the remaining four cases were very incipient cases of tuberculosis.

During our study for diagnosis their basal metabolic rates were determined because every one presented moderate to moderately severe classical symptoms of thyroid disturbance, which clinically pointed more to hyperthyroidism than to hypothyroidism, namely, some to much nervousness, vasomotor disturbance, loss of some weight, impaired appetite and digestion, tremors, increased pulse rate, malaise and impaired strength. All were positively under basal conditions and afebrile. One case had a plus basal metabolism rate.

Five of these six cases had basal rates below normal, though this includes two

*From the Metabolic Laboratory of the North Carolina Sanatorium, Sanatorium, N. C.

cases with minus 5 and minus 7, which figures we believe to be below normal, because, after thorough hookworm treatment, they rose nine and ten points, respectively. The lowest finding was minus 28, which was repeated the next day and found to be minus 26.5. The average for the five cases was minus 14.4. This lowest rate was in a non-tuberculous young man in whom we could make no other diagnosis than uncinariasis, though incipient myxedema was considered and ruled out.

A still more interesting observation was the fact that in four cases the rate slowly approached or reached normal after thorough hookworm treatment, the time required being a few to several weeks. The fifth case would not remain under or return for observation, though his physician recently stated that now, several months after hookworm treatment, he is apparently well.

Properly in this report the degree of anemia should be considered. In these cases red blood cell counts, hemoglobin estimations by Sahli's method, and a study of the stained red blood cells were carefully done. In no case was the anemia severe. The counts ranged from 3,460,000 to 4,960,000. The hemoglobin ranged from 65 to 85 per cent. The smears showed slightly to moderately pale red blood cells, though otherwise negative.

Tabulation of the degree of anemia and the basal metabolic rates shows no relationship whatsoever in this series.

Since these observations were made all these cases have been carefully followed up, and to date are apparently well and are free of most, if not all, of the symptoms mentioned above. They have received no other treatment except sanatorium regimen for those with active tuberculous lesions.

This brief report is made on such a small series for the following reasons:

(1) In the hookworm area of the United States probably only three or four workers have this admittedly accurate means for determining basal rates. Therefore, they should be acquainted with and add to these observations.

(2) To present some further evidence that a moderately increased or decreased basal metabolic rate does not in itself necessarily mean thyroid disease.

(3) To point out the importance of not letting this laboratory procedure alone make the diagnosis.

(4) To urge that we take a larger clinical view of this most valuable procedure by demanding from ourselves the answer to the following question: "Why is this thyroid gland (its thyroxin output being metabolism's pacemaker) hyper- or hypofunctioning?"

MEDICAL TREATMENT OF CONGENITAL HYPERTROPHIC PYLORIC STENOSIS*

By James W. Bruce, M.D.,
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So much has been written and said about congenital hypertrophic pyloric stenosis in the past few years that we now know it is not so rare as it was once thought to be. The history and physical findings are so characteristic that the disease can scarcely be missed if the possibility of its presence is borne in mind. Any baby less than two months old that consistently vomits its mother's breast milk, especially if the vomiting is at all forceful, should be regarded as a probable case of pyloric stenosis until proved otherwise. The diagnosis rests upon the classical signs: projectile vomiting, visible gastric peristalsis and palpable pyloric tumor. The last named is the weak link in the chain as it is often indefinite or impossible to demonstrate. Retention of food in the stomach for a long period of time can be demonstrated by means of the stomach tube or x-ray. The writer does not feel that the x-ray is necessary in most of these cases as the diagnosis is usually apparent.

The question as to whether obstruction is caused by hypertrophy or spasm of the pyloric muscle causes endless discussion. Probably both conditions are present in

*Read before the Society of Physicians and Surgeons, Louisville, Ky.

every case. At any rate a differentiation between the two is usually impossible and makes little difference, as every case should be treated medically first, and if that is unsuccessful should then be operated upon.

Ten years ago the treatment of congenital pyloric stenosis was a thing to be dreaded alike by medical men and surgeons. Medical treatment consisted of gastric lavage, hot applications to the abdomen, careful feeding and nursing, and antispasmodics. In skillful hands, results were surprisingly good, but the starved infants dragged out a miserable existence for months before they improved, during which time their depleted condition rendered them easy prey to intercurrent infection. Surgery had only gastro-enterostomy to offer. While the operative mortality was high, it was considered the proper procedure in severe cases.[1]

In 1914, Downes first introduced the Fredet-Rammstedt, or muscle cutting, operation into this country. On account of its simplicity and brilliant therapeutic results, it immediately became popular and soon supplanted gastro-enterostomy as the accepted surgical procedure. Results with this operation were so gratifying that it was thought by many to be indicated as soon as the diagnosis of pyloric stenosis was made or after medical treatment had been carried out for seven to ten days without improvement.[2]

The question of prognosis has been studied by Goldbloom and Spence[3] in 163 Fredet-Rammstedt operations performed at the Babies' Hospital in New York City from 1914 to 1919. The majority were performed by Dr. William Downes. The mortality for the whole series was 19.6 per cent. However, many of these fatal results were in hopeless cases in which operation was done as an only hope. Their study shows that "the mortality for breast-fed infants who had vomited less than four weeks and who had lost less than 20 per cent of their best weight is almost nil." Duration of symptoms prior to operation and extent of weight loss are considered the two most important points in prognosis. Also breast-fed babies do three times as well as bottle-fed babies. However, accidents will happen. Hemorrhage, peritonitis and shock are occasionally fatal to babies in good pre-operative condition operated upon by the most skillful surgeons. Post-operative care is sometimes exceedingly difficult, as gastro-enteritis develops easily in the starved gut and stubbornly resists treatment.[4]

In 1918, two advances were made in the medical treatment of pyloric stenosis which put it on a par with, or ahead of, surgical treatment in therapeutic efficiency. Sauer[5] brought out thick cereal feeding and Haas[6] first used large doses of atropin.

Sauer conceived the idea of thick cereal feeding after observing the fact that ruminators and infants with neurotic vomiting could not regurgitate this food. It is mechanically impossible to get it up. The thick pasty mass resists the reverse peristaltic movements of the stomach and slowly passes through the pylorus. The mechanics of this process are not understood at present. Fluid given at the same time as the cereal, or later, is vomited, bringing some of the cereal with it. The administration of fluid is the most difficult feature of treatment and will be discussed more fully later. Sauer's original formula has been modified somewhat. A formula which is widely used and which the writer has found very satisfactory is as follows:

Whole milk, 1 pint; farina, 4 level tablespoonfuls, and sugar, 1 level tablespoonful.

Cook until cereal sticks to an inverted spoon. Two hours in a double boiler is sufficient. One to three tablespoons of cereal are fed at four-hour intervals. There are several methods of giving it to the infant. Probably the easiest is to cut a large hole in a hygeia nipple and fill the large rubber cup of the nipple with cereal and poke it through the hole with a clean finger. Another method is to take small quantities on a wooden tongue depressor and put it far back on the infant's tongue. It is a tedious process any way it is given and at first one feeding of 1 to 2 tablespoonfuls may take an hour. However, after a while the infant learns to swallow better and takes it better. Food made with rice flour or barley flour is some-

times more easily given and better digested than food made with farina.

Why is it that thick cereal is digested by babies with pyloric stenosis while normal babies contract diarrhea from it? A logical answer is that the food is passed through the pylorus so slowly that the intestines can take care of it. The author has come to regard the onset of diarrhea in babies treated in this way as a favorable sign. In cases where it has occurred, cereal feedings have been stopped immediately; diarrhea has been checked without difficulty; and thereafter the babies were able to take liquid feedings without vomiting. It would seem that the explanation for this is that the pylorus has opened up, allowing the cereal to go through faster than the baby can digest it. These attacks of diarrhea are preceded by periods of unusually good gaining and freedom from vomiting. This would seem to indicate that the pylorus is letting the food through more rapidly, until finally the digestive capacity of the intestines is overtaxed and diarrhea results. These periods of relaxation of the pylorus may be temporary, i. e., vomiting may begin again after a time, and cereal feedings must again be administered.

It is necessary in most cases of pyloric stenosis to give some cereal at each feeding. In milder cases it can be given at alternate feedings. Milk mixtures appropriate for the age and weight are given after the cereal, or the baby is allowed to nurse. The quantity of milk mixture and the length of time at the breast must be carefully regulated for each case. A very frequent experience is that the baby will hold the cereal and vomit the milk. In cases where all fluids are vomited it is almost impossible to make babies gain on cereal alone.

The administration of water is always a difficult problem. Cases of moderate severity can take one to two ounces every hour. Severe cases, however, vomit all liquid; and water has to be given by artificial means. Proctoclysis in the writer's hands has never been successful and this is the general experience. Hypodermoclysis and intraperitoneal injection are emergency methods that one does not like to use for more than a few days.

The most effective method of administering fluids artificially for a long period of time is the nasal drip. This is especially effective in young infants who have not the power of grasping objects. A small catheter (No. 8-10 French) is passed into the stomach via the nares. This is then connected with an ordinary Murphy drip. The writer has recently had occasion to use the method on the worst case of pyloric stenosis he ever saw and the baby took 20 to 30 drops per minute for a week without vomiting. The solution used was glucose 5 per cent. The object was to get the baby in condition for operation and by means of cereal feedings and nasal drip it was possible to improve its condition a great deal. A Fredet-Rammstedt operation was done and the baby made a good ether recovery, but died five days later of acute enteritis, which developed three days after operation.

The use of atropin in pyloric stenosis is an old idea, but no one had ever used it in the dosage that Haas proposed. He believes that pyloric stenosis is exaggerated pyloric spasm and that both are due to vagotonia or over-activity of the vegetative nervous system. Certainly there is much to be said in favor of his theory. Histologically the pyloric tumor consists of normal smooth muscle cells with no increase of fibrous tissue or other pathological elements. There is nothing abnormal about the structures involved except hypertrophy of the circular muscle of the pylorus. Also, within thirty days or more following Fredet-Rammstedt operations, the pyloric muscle has regained its normal size and appearance except for the operative scar.[7] [8]

It is hard to believe that spasm does not play a large part in every case. Haas begins with atropin grain 1/1000 and rapidly increases the dosage until at the end of twenty-four hours grain 6/1000 or 7/1000 is given with each feeding. He gives grain 1/25 to 1/50 of atropin in twenty-four hours and has used as much as grain 1/16. Careful observation is of course necessary for toxic symptoms, e. g., flushing of the face, dilated pupils, dry mouth, etc. He finds that such symptoms rarely occur, as these babies have a marked tolerance for the drug. The rea

son the atropin treatment has not been more generally successful is due to failure to use sufficient dosage. One word of warning is necessary. While the quantity of atropin can be increased rapidly without any difficulty, it must be withdrawn very slowly. If it is taken away too quickly, the baby becomes fretful, restless, cries a great deal and frequently begins vomiting again.

By combining these two methods, i. e., cereal feedings and atropin, one has a formidable method of attacking pyloric stenosis and one which makes operation rarely necessary. The author has had better success with atropin and cereal than with cereal alone. He has never tried atropin alone. In Case I, related below, cereal was first given alone. The baby retained cereal, but vomited fluids and did not gain. When atropin was pushed, fluids were retained and the baby gained. In Case II, atropin in large doses and cereal were given from the beginning. The baby vomited almost nothing and began to gain immediately.

Surgery is indicated:

(1) When it is impossible to get good nursing care for a long period of time, one to two months. Professional nurses are not necessary.

(2) Where the baby fails to gain on medical treatment after three weeks' trial.

(3) Where fluids are vomited and have to be given artificially for more than one week. The danger of intercurrent infection is so great here that longer medical treatment seems inadvisable.

Case I.—First seen January 15, 1923. J. H., age 2 months, normal delivery, birth weight 6 pounds 1 ounce. Breast-fed and gained 6/8 oz. a week for five weeks. Then began to vomit. Vomiting got steadily worse. No gain previous two weeks. Constipated. Vomiting is forceful and usually comes immediately after nursing.

Examination shows fairly well nourished male baby weighing 8½ pounds. Physical examination negative except for nursing five minutes, when well marked peristaltic waves were visible characteristic of pyloric stenosis. No tumor was felt. The baby was put on thick cereal feedings every four hours, followed by ten-minute nursing. Water 1 oz. was given every hour. Water and some food were vomited. Water was given by rectum, 2 oz. every two hours.

January 25, 1923.—No gain since first seen. Vomits fluids. Atropin started and increased in three days to grain 1/30 in twenty-four hours.

February 17, 1923.—Weight, 9 lbs. 15 oz. Has vomited once or twice a day since atropin was started. Fluid by bowel not necessary for two weeks.

February 19, 1923.—Loose mucous stools. Stop cereal feedings. Nurse breast. Compound chalk mixture.

February 21, 1923.—Diarrhea checked. No more vomiting. Nurse breast alone.

May 1, 1923.—Five months old. No vomiting since February 21. Now on bottle feedings. Condition good. Weight, 12 lbs. 10 oz.

Case II.—First seen March 15, 1923. G. B., age six weeks, normal delivery, birth weight unknown. Breast fed one week. Since that time on milk mixtures. Vomited most of feedings since birth. Vomits with force. Physical examination shows a pale, flabby, poorly-nourished but not emaciated baby of 9 lbs. 7 oz. No physical defects found. After drinking 2 oz. of water, well marked peristaltic waves were visible over stomach. No tumor felt. Put on cereal feedings every four hours, using the following formula:

Whole milk	5 ounces
Water	5 ounces
Sugar	1 teaspoonful

Two ounces after cereal.

Atropin grain 1/1000 before each feeding and increase to grain 4/1000 (grain 1/50 in twenty-four hours). Water 1 ounce every hour.

March 22.—Weight, 10 lbs. 1 oz. Atropin grain 4/1000 every two hours (1/25 grain in twenty-four hours). Vomits once or twice a day.

April 11, 1923.—Weight, 11 lbs. 1 oz. Has vomited two or three times a week for the previous two weeks. Today developed loose mucous stools. Cereal feedings stopped. Protein milk ordered.

April 14, 1923.—Stools normal. Put on rational formula.

May 10, 1923.—Weight, 12 lbs. 10 oz. No vomiting since April 14. Condition good.

CONCLUSIONS

(1) Atropin in large doses and thick cereal feedings are more effective in the treatment of congenital pyloric stenosis when used in combination than when either one is used by itself.

(2) Surgery is rarely necessary.

(3) When fluids have to be given artificially the nasal drip is the most practical and effective method of administration.

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SECONDARY HYPERTROPHIC OSTEOARTHROPATHY AND CIRRHOSIS OF THE LIVER

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Secondary hypertrophic osteoarthropathy is not an extremely rare condition. In the far greater percentage of cases it is associated with pulmonary conditions. When, however, it is present in conjunction with cirrhosis of the liver it assumes a greater interest not only on account of its rarity but also because of its etiologic relationship.

A review of the literature at my command shows only five cases in which the unimpeachable association of the two conditions was present.

1895: Gilbert and Fournier.[1] Augustine C., age 13 years. At the age of 5½ years, enlargement of the abdomen was detected and at the age of 6 a disease of the liver was diagnosed. When 7 years old there were hypertrophy of the liver and of the spleen. At the age of 10 jaundice appeared, accompanied by a notable increase in size of, and violent pains in, the abdomen. Examination June 9, 1892, showed intense icterus of the skin, conjunctivae and mucous membranes. The last phalanges of the fingers were drumstick shaped. The extremities of the tibiae were increased. The knees had increased in size and contained a little liquid. The great toe was drumstick shaped. The liver and spleen were markedly enlarged. She died a few weeks later.

1895: Gilbert and Fournier.[1] Mlle. D., age 13. Her illness began at the age of 11. She presented an intense icterus and the feces were only slightly colored, on several occasions there being an almost complete absence of color. For about a year the patient had had epistaxis. Examination of the liver showed a slight hypertrophy. The spleen was only slightly increased in volume. The skeleton showed several important alterations. The terminal phalanges of the fingers and toes were markedly drum-stick shaped. The knees were swollen. Hypertrophy of the bone extremities was easily detected. There was a little hydrathrosis. The joints were slightly painful. The patient complained a little with the wrists and ankles.

1897: Obermayer.[2] F. K., age 20, single, laborer. Received February 28, 1893; died March 27, 1893. Following an attack of intermittent fever manifested by morning and afternoon chills, he gradually developed jaundice of the skin, with grayish, white stools. About two months later the icterus became progressively more intense and he began to cough and had bloody expectoration. The abdomen swelled and there was profuse diarrhea. The stools were colorless and the urine was scanty and dark. In the middle of January, 1893, the feet and hands began to swell and the edema and jaundice gradually increased. Examination showed a general and intensive jaundice, with edema of the lower extremities. Both knee joints contained fluid. All the joints were painful. The epiphyses of the forearm bones were swollen and sensitive and the terminal phalanges of the fingers were drum-stick shaped. The epiphyses of the leg bones were swollen, thickened and sensitive. The finger nails were bluish and watch crystal shaped. The abdomen was swollen and the superficial veins dilated. The liver extended in the axillary line four finger breadths below the costal margin. The spleen was enormously enlarged, reaching to the umbilicus. The sputum was tenacious, with purulent lumps of greenish, yellow color and blood-tinged. Microscopically there were white and red blood cells, squamous epithelium, fatty acid crystals and a few bronchial epithelia. There were no tubercle bacilli. In the urine were abundant bile pigment and albumin. There were hyalin, granular and epithelial casts. Autopsy showed biliary cirrhosis and joint involvement. In both knee joints the synovial fluid was increased, dark, thickened and icteric. The synovial membrane of both joints was loosened, reddened and the right especially permeated with hemorrhages. The periosteum toward the lower epiphyses of the tibiae was thickened and fast adherent to a thick layer of new osseous tissue.

1897: Obermayer.[2] A. M., age 46, tiler, married. Received April 28, 1892; died December 10, 1893. The patient was a heavy drinker, having consumed as high as ten liters of beer daily. Six years previous to examination an illness had begun with vomiting of green material, followed by jaundice of the skin and sclerae. Christmas, 1891, he again became jaundiced and felt weak. Examination April 28, 1892. He was generally jaundiced, the abdomen was swollen and the border of the liver was distinctly felt three finger breadths below the costal margin in the nipple line. The spleen was hard, easily palpable and not tender. The urine was dark red and contained bile pigment, but no biliary acids. Later he developed a cough and the toes and fingers became drum-stick shaped. He complained of pains in the left hip and loin and later also in the ankles, which were tender to pressure. The epiphyses below the knees became tender and those of the ankle appeared swollen. The same condition prevailed in the epiphyses of the bones of the forearm. At autopsy were found biliary cirrhosis, chronic catarrh of the common duct, duodenum, stomach, ileum and colon, enlargement of the spleen, pneumonia, pleurisy, pericarditis and periostitis of the tibiae and drum-stick fingers and toes.

1901: Chatin and Cade.[3] Male, age 50 years, entered the hospital September, 1900, with jaundice of about three months' duration, which had developed insidiously. The persistence of biliary retention, together with very marked hypertrophy of the liver and splenomegaly, led to the diagnosis of Hanot's cirrhosis. Cachexia

was progressive and bronchopneumonia supervened, of which the patient died. The fingers were drum-stick shaped and radiographs showed bony alterations of the index, middle and ring fingers of both hands, and these areas were studded with osteophytes. At autopsy were found a suppurative angiocholecystitis and biliary cirrhosis due to retention.

In addition to these cases several have been reported in which the diagnosis either of biliary cirrhosis or of secondary hypertrophic osteoarthropathy seems doubtful.

1895: Gilbert and Fournier.[1] Male, age 19. His illness began two years previously with pains in right hypochondrium and jaundice. The abdomen was distended, the liver greatly enlarged, the spleen was beyond the umbilicus and below the iliac crest; cough; dullness below the left clavicle with rough respiratory sounds; subcrepitant rales at the left base; clubbed fingers, incurved nails, but no other joint involvement.

1897: Obermayer.[2] Male, age 27. His illness began several months previously with weakness, jaundice, and pains in the back and liver region; later abdominal distension and cough with scanty mucopurulent sputum supervened. The liver was 5 c.m. beyond the costal margin; the spleen greatly enlarged; the ankles and heels swollen, red and painful.

1897: Obermayer.[2] Male, age 50. The illness began three years previously with jaundice. Later there developed a soreness in the right hypochondrium; the liver was a hand breadth beyond the costal arch; the spleen 10 c.m. beyond the costal margin. Bile pigment was present in the urine. Drum-stick fingers and toes and thickening of the malleoli and foot bones appeared.

1897: Obermayer.[2] Male, age 54. His illness began 30 years previously with jaundice and abdominal pains. The liver was markedly enlarged and a mass the size of an apple was detected in the right anterior axillary line apparently related to the liver; the spleen was palpable; drum-stick fingers and tenderness of the epiphyses of the bones of the forearm and leg were present. The autopsy showed stenosis of the common duct with enormous dilatation of the gall bladder and hepatic bile vessels, enlargement of the epiphyses of the bones of the legs and forearms and drum-stick fingers.

1901: Abadie.[4] Male, age 37. The illness began one year previously with intermittent fever followed by ascites, which was tapped seven times. Diagnosis: cirrhosis of the liver. Coming under the care of Abadie, later malaria was diagnosed. He had a dirty yellow jaundice; the liver was three finger breadths beyond the costal margin and the spleen was considerably enlarged. The fingers and toes were drum-stick shaped with watch crystal nails. The x-ray showed no bone or joint changes.

1901: Parmentier and Castaigne[5] reported a patient with osteoarthropathy consecutive to hypertrophic cirrhosis. The patient, complaining of gastro-intestinal symptoms, showed icterus and painful joints. Hypertrophy of the liver and spleen were present and the stools were colorless. The lungs, heart and kidney functions were normal. The fingers and toes were of the hippocratic type and the wrists, ankles and knees were increased in size.

In the following case it is to be regretted that a thorough x-ray study was not possible, the patient becoming bedridden soon after the first examination. It is believed, however, that there can be no question as to the presence of both Hanot's and Marie's diseases. The onset of the disease with jaundice, which persisted more than three years, hepatic and splenic enlargement, hemorrhages, the absence of ascites except as a terminal event, and the results of a liver biopsy warrant the diagnosis of biliary cirrhosis, and the advanced kyphosis, causing a shortening in height of five inches, the obvious changes in the epiphyses of the bones of the arms and legs with well marked clubbing of the fingers and toes justify the diagnosis of secondary hypertrophic osteoarthropathy.

The patient was a white male, age 35, married, a moving picture operator by occupation. His family history was unimportant except that his mother died at the age of 65 with heart trouble and "softening of the bones."

As a boy he had occasional attacks of tonsillitis and had gonorrhea at 22. The right clavicle was broken in 1914 in a motorcycle accident. He drank beer in moderation till seven or eight years ago and played a cornet in a band from the age of 15 until he was 24. Three years ago he was 5 feet 10 inches tall. His best weight was 200 pounds seven to eight years ago. His average weight was 180 pounds.

His present illness began November, 1919, with jaundice noted first in the sclerae, and then throughout the skin. In March, 1920, "rheumatism" began in the hips. In April, 1920, he had a severe hemorrhage, passing a large quantity of dark blood from the bowel, and vomiting a lesser amount, causing a drop in his hemoglobin to 30 per cent. He received two transfusions, but was unable to go to work until September, 1920. A diagnosis of Hanot's cirrhosis is said to have been made at that time. In December, 1920, he had an exploratory operation upon the liver with drainage of the gall bladder. A liver biopsy is said to have confirmed the diagnosis of Hanot's cirrhosis. Both the liver and the spleen are said to have been markedly enlarged at that time. He was able to work from March, 1921, until December 24, 1921, when he had another severe hemorrhage, passing a large amount of blood from the bowels. Early in January, 1922, he was given another transfusion. He has

been unable to work for a year. He had had a slight cough during parts of the past two winters.

Examined December 25, 1922, he was complaining of pains in the hips and legs, occasional pains in the shoulders, stools sometimes grayish, urine very dark and sleeping poorly on account of joint pains. He appeared markedly jaundiced, emaciated, and barrel-chested with winged scapulae. His muscles were atrophied and flabby. His height was 5 feet 5 inches (loss of 5 inches in three years) and his weight was 128 pounds (52 pounds below the average). The pulse rate was 94 and the brachial arteries were thickened. The blood pressure was 100 systolic, 70 diastolic. The temperature was 98.4°. The apex beat of the heart was in the fifth interspace in the midclavicular line which corresponded to the left border of percussion dullness, the right border of dullness being one-half inch beyond the right sternal margin. There were no adventitious sounds. There was an area of impaired resonance about the size of the palm of the hand between the left nipple and the anterior axillary line, the chest showing the characteristic deformity of kyphosis.

The abdomen was distended, but no free fluid could be detected. The veins over the lower abdomen were dilated. The liver dullness was four and a half inches in the nipple line and the same in the midsternal line. The spleen was not palpable, though its area of dullness appeared to be increased.

Both achilles reflexes were absent; the right knee-jerk was gone; the left sluggish, and the reflexes of the right arm were diminished.

The pupils, eyegrounds and Romberg were negative.

The skin and sclerae were decidedly jaundiced, the nails and lips were cyanotic and there was slight edema of the feet and ankles.

Marked kyphosis of the upper six dorsal vertebrae existed, accounting for the loss of five inches in stature. The fingers were very decidedly clubbed and the finger nails were of the watch-crystal type, the same condition showing in the big, second and third toes. The epiphyses of the lower ends of the radius and ulna, of the lower end of the femora and of both ends of the tibia and fibula on both right and left sides appeared enlarged.

The twenty-four hour of quantity of urine was 30 ounces, color that of weak coffee, specific gravity 1.025, acid reaction, and contained ¼ gram of albumin to the liter. Bile was present; there was no blood or free hemoglobin. The test for urobilin using zinc chlorid and ammonia was negative. The copper salts were not reduced. The addition of ferric chlorid gave a gray precipitate which blackened on standing, suggesting melanin. Microscopically a few leucocytes, only, were found. The blood hemoglobin was 77 per cent (Dare). There were 4,760,000 erythrocytes, 11,200 leucocytes, and 110,000 platelets. Polymorphonuclears were 76 per cent; lymphocytes, 18 per cent; mononuclears, 5.5 per cent; and eosinophils, 0.5 per cent. A stained film was negative. The blood fragility test showed beginning hemolysis at 0.50 per cent; complete at 0.28 per cent. There were 19 per cent reticulated red cells staining with brilliant cresyl blue. The coagulation time was more than eight and less than eleven minutes. The bleeding time was three minutes. The Wassermann was negative. The blood urea was 23.14 mg. per 100 c. c.; blood sugar, 95 mgs.; and creatinin, 1.5 mgs. Four subsequent examinations of the urine resulted in the same findings as the first. The red cell count dropped to 3,650,000 on January 9, 1923, and to 2,480,000 on January 30, 1923. The reticulated cells numbered 19 per cent on January 9, and 10.5 per cent on January 16.

A few days after examination he became bedridden from pains in the hips and legs and within a week the abdomen was distended with fluid.

By January 24 the ascitic accumulation was embarrassing the respiration and there was marked edema of the feet, legs, thighs and external genitals. On this date the abdomen was tapped and about two gallons of fluid removed. The fluid was of amber color, specific gravity 1.006 and a stained centrifuged specimen showed a few lymphocytes only. After the tapping the liver dullness was found to be 6 inches in the nipple and midsternal lines and the spleen palpable just beyond the costal margin.

On February 3, 1923, he died.

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TREATMENT OF CHILDREN IN THE HOME AND THE HOSPITAL*

By John Zahorsky, M.D.,
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The unit of our democracy is the home. Without discussing the sociological phase of the subject, I desire to emphasize the importance of the home in the welfare of children. It is the natural place of protection from a multitude of injurious agencies and the most effective method of isolation from pathogenic influences. The young child reared in this separate place by healthy parents with love and affection is indeed fortunate if the parents possess both wisdom and diligence. Here the baby comes in contact with adults only

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who are relatively immune to disease and thereby is spared many dangerous diseases at the most susceptible time of life.

It seems to me that one duty of the state is to favor those conditions which insure a home to every young couple and at the same time educate them in the proper care of the home and best rules for the care of the child.

While numerous efforts have been made to rear children in special asylums, the experience of the ages is against this method. It is best for the child that it be reared in the home under parental supervision. Asylums are poor substitutes for the individual care in the home and should be employed only for those who have no home.

If the home is the best place for the care of the healthy child, it is also the best place for the healing of the sick child. Very slight modifications of the household routine are necessary to establish all that is required to care for the sick in the great majority of children's diseases. The educated mother is a better nurse for her sick child than the trained nurse, since the former can see and appreciate changes in her child that the latter can never perceive.

The mother understands the language of the young child; the nurse does not. Even when a trained nurse has to be introduced into the household the mother should watch her child. Abundant experience has shown that this is a safe rule.

We arrive at the principal point of the paper. If the home is the best place to treat the sick child, the pediatrician must learn to adjust his technical knowledge to do efficient work in every home. In these days of gasoline transportation there should be no excuse for the physician's not reaching the home of his patient promptly even at a distance.

It is a great defect of our present medical education that the young physician has not learned to adjust his knowledge to the needs of home therapeutics. In fact, it has been my experience that the modern hospital-trained physician does not feel competent to treat the sick child in the home. He instinctively wants to send him to the hospital.

The children's hospital is an expensive institution and, excepting for surgical cases, should serve merely as an adjunct to home practice. The more efficient the work is in the home, the less needful becomes the hospital.

Babies notoriously do poorly in a hospital. To remove the young child from its home surroundings to a new place to be administered to by unknown persons in a strange manner lowers the resistance of the child and is not good pediatrics. The resistance of the child must always be safeguarded and "Heimweh" is a well-known factor in diminishing this resistance. If the conscious child must be sent to the hospital the mother should accompany it and remain with it, at least until it becomes accustomed to its new environment.

Let me not be misunderstood. The children's hospital well equipped, properly endowed and connected with the research department of a university can do invaluable work in the scientific study of disease. It is the place for the sick child who has no home. But fully 95 per cent of all children's diseases are best studied and treated at home, first because it is less expensive to the community, and, second, because the home environment is a powerful therapeutic aid, which is lost when the child is taken to the hospital.

It is not necessary to give figures as to the cost of caring for a child at home and in the hospital. I calculate the average cost of a case of croupous pneumonia to a parent, including the physician's fee, is about $50. In hospital care of the same case this cost must be trebled. If special day and night nurses are employed it is quadrupled.

It is for this reason I have insisted that pediatrics should be based on both efficient and economic principles. To care for the sick children of a community we do not need hospitals, but we do need better trained pediatricians, who realize that their work has as its purpose medical service to the children and not a large pecuniary reward. The pediatrician should train the young mothers himself, follow them in their home, and supervise their work, or have a well trained nurse as an assistant who trains them under his

direction. The babies under his care must grow and develop normally and sickness must be rare. This should be the guiding principal of the pediatrician.

Nothing in this article should be construed to be an attack on numerous welfare movements in this country, which have for their object the education of the mothers. Each pediatrician should be the center of such a welfare movement assisted by his assistants and friends. There must be a recognition of human ignorance and indolence and a knowledge of some remedial methods, with a will to apply them.

There seem to be two views of the work of the pediatrician. One is that he is a physician trained in the prophylaxis and treatment of children's diseases, whose function is to keep the children well and strong; the other is that he is a specialist who can diagnosticate and suggest treatment for puzzling and obscure children's ailments. Probably we need both kinds. The first class, however, is needed most.

In recent years the profession has had a great drive to increase the efficiency of medical work in hospitals, and no one will doubt what this has accomplished. We need a similar drive to increase efficiency of the work in the home. This is a most difficult problem, but why not gradually compare methods of practice in the home and private office and publish a standard of work? But before doing this we must learn what efficient and economical methods are successfully used by our most successful physicians. We should not let scientific experimental pediatrics entirely displace practical pediatrics from our pediatric journals.

In order to bring this subject before you in a concrete form I will give a brief outline of practical procedures which I have adopted for my own work and to which I am gradually adjusting my practice at the office and the home. If I can obtain some friendly criticisms and suggestions it will have served its purpose. However, it may also serve as a standard of comparison for younger pediatricians who have as yet not definitely planned their work in the community.

PLAN OF PEDIATRIC WORK

A. *Personnel*

(1) Physician
(2) Assistant physician
(3) Laboratory technician
(4) Recording clerk
(5) One or two trained nurses.

The assistant physician is a young trained pediatrician, whose duty it is to make visits to the home. These include emergency work, visits to convalescent patients who require watching, making bedside laboratory tests, taking cultures, injecting serums and vaccines, etc.

The laboratory technician is a trained woman who does routine laboratory work in the office, such as blood, urine, stool and culture examinations. She also assists in the examination and preparation of the patients, gives hypodermic injections, takes blood and stool specimens, etc.

The recording clerk writes down the history of cases, weighs the patient, counts the pulse, takes the temperature and prepares the patient for physical examination.

One or two nurses are used from time to time to assist in instructing mothers in the care of babies, especially difficult feeding cases. For the well-to-do, of course, trained nurses are generally employed in all serious illnesses.

B. *The Home and Office Service*

(1) Supervision of the growth and development of the child.
(2) Special prophylaxis among a certain group of children
(3) Diagnosis of diseases
(4) Treatment of diseases

Shall we permit the mother only to supervise the growth and development of the child? I think not. It is our duty to insist on a regular physical examination at least monthly in the care of infants; at least once a year in the care of children. A record of this should be kept.

The special prophylaxis includes vaccination and immunization against diphtheria, and so far, we may safely say, an attempted immunization of respiratory and intestinal infections.

In the diagnosis of diseases a bedside laboratory is often necessary. A small portable microscope with which the blood,

the urine and the stool may be inspected is very helpful. The leucocyte count is becoming increasingly necessary in diagnosis.

C. *Hospital Service*

(1) Cases demanding a surgical operation
(2) Sick children who have no home
(3) Some contagious diseases
(4) Children in a critical condition from inefficient treatment in the home

All children who need or may soon need a surgical operation should be sent to a hospital. In this class are cases of appendicitis, pyloric stenosis, osteoperiostitis, empyema, etc.

Children reared in insanitary parts of the city, children in many hotels and apartments are better if sent to the hospital.

Often isolation in the home, in the case of diphtheria or scarlet fever, is impossible and the child must be sent to an isolation hospital.

The fourth class now includes altogether too many children. This defect will be remedied in the future when the modern pediatrician is generally available.

An example may serve to clarify what is meant by efficient work in the home.

An infant suffers from a gastro-enteritis. The physician must bear in mind at once the danger of excessive loss of water, alkalis and blood volume. The first effort must be made to quiet the irritability of the stomach so that water and food can be retained. At the same time the water loss from the skin must be diminished by hydrotherapy. Often very simple measures succeed in arresting vomiting. Then alkaline waters are gradually added, slowly non-fermentable carbohydrates are administered. We have prevented dehydration, acidosis and dangerous inanition, and therefore do not have to resort to intravenous or intraperitoneal injections or perform a blood transfusion. Attention to small details will accomplish early what only operative procedures can do later imperfectly.

Another example: A child suffers from diphtheria with laryngeal symptoms. Vigorous treatment with antitoxin, inhalations, sedatives and emetics prevents the necessity of intubation.

The great pediatric problem, then, is to prevent illness and to so arrange our therapeutic work that any sickness may not assume a dangerous form. This has to be done in the home. Hence, the real question is not what can be done in the hospital for a severe case of double pneumonia, but what can be done in the home to force the child to throw off its pneumococcus infection by means of the upper respiratory tract and not the lungs. It is more favorable to the child's resistance to scarlet fever to be cuddled and pampered by its parents than to receive nasal irrigations in some strange hospital. The soothing gentle voice of the mother may produce a more wholesome sleep than a powerful hypnotic.

Hence, I desire to repeat, the greater the efficiency in early diagnosis and treatment in the home the less will need arise for hospital treatment.

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DISCUSSION

Dr. Lewis W. Elias, Asheville, N. C.—This question depends on many different factors: what sort of a home you have, what sort of a nurse you have, what sort of a patient. From one standpoint, any one who has to deal with a nervous mother would certainly say, "For goodness sake get the child to the hospital or anywhere away from the mother." There are other things to be considered. With a skillful mother, unless the case were an urgent hospital one, you would hesitate at sending the child to the hospital. We cannot change in a day or even in a generation the type of civilization we have, and so we cannot easily change the mother in the home. We can change the nurse very much more quickly. If there is a fault in the home and an equal fault in the hospital our most successful attack would be on the fault in the hospital. I think Dr. Zahorsky is entirely right: that we should have our attention called to defects in hospital care, carelessness of the nurse, etc., for which we doctors are partly responsible because of the way we train them. The nurses want to get through their work as soon as possible. We should inspire our nurses with greater idealism in the care of the patient. I think a most important factor is that our nurses need to have a little more interest in the welfare of the particular patient as a human, to treat the patient as they would one of their own family.

Another thing that might be mentioned is hospitalism. You have heard from me on that subject before. You probably get more fresh air

in the home than in the hospital, built as they are at present. There is a place near Asheville where there are about fifty children from a few months old up, and I do not see a half dozen of them a year for acute illnesses. They stay out of doors most of the time and are practically never sick.

Dr. J. O. Elrod, Forsyth, Ga.—We in the country who have to do work under all kinds of conditions realize what it means to have a child treated in the home a great deal more than do the men who treat children in hospitals. A child treated in the home has the surroundings that it is accustomed to, and contentment with a child either well or sick means a great deal. You put a child into a hospital with strangers to take care of him, it takes him several days to become accustomed to the surroundings, and the nurses cannot possibly have the feeling toward the child that its mother has. The mother knows the peculiarities of the child a great deal better than these nurses regardless of how efficient they may be. My experience with nurses is that they may be conscientious, but you cannot always depend on the nurse's chart more than you can on the memory of the mother. I have very little trouble in getting mothers to keep a chart. All I have to do as a rule is to tell them what I want. Of course, you come across mothers in the rural districts who cannot keep a chart. Some of them cannot read or write, but they keep in their minds a pretty good chart of what has happened from the time you last saw the child until you see it again. When these children are carried into the hospital they naturally have a certain amount of nervousness and fear and this, of course, lowers their resistance. I live in a county of 400 square miles with 16,000 population. Last year we had 435 births in that county and we had four deaths from summer complaint, two colored and two white children. We have a Bureau of Vital Statistics in Georgia and we have an accurate registration in our county. That is home practice. I doubt that many hospitals can show a record much better than that. We did not have a death in the county from any communicable disease. I do not take credit for that. It shows that home treatment properly carried out can be as efficient as any hospital treatment.

Dr. Jerome Meyer, Birmingham, Ala.—I want to say a word in defense of children's hospitals. I think only the best nurses should be selected, those who command complete confidence of both doctors and mothers. We have in Birmingham at the present moment a very poorly equipped hospital, but we overcome this handicap by the excellent nursing staff. We get the best results by insisting that the mother remain away from the child, allowing visitors only once a week with the exception of the critically ill. Since employing these regulations the results have been strikingly good. I have in mind the child of one of our leading physicians who had been placed under the care of one of the members of the staff for malnutrition. An attempt to treat the case had been made at home with the assistance of an exceptionally intelligent mother, but no progress was made until the baby was placed in the Children's Hospital. This was not a case where it was impossible to have had all necessary care and proper nourishment at home, as is the case so frequently with the average layman's child.

Dr. Robert A. Strong, Pass Christian, Miss.—Often we see highly trained men, well qualified in every branch of medicine, who are entirely unsuccessful in the practice of medicine. They know medicine, but are not able to make contact with the people. They can practice very satisfactorily in the hospital, but they cannot go into the home where they have to depend upon their own resourcefulness to utilize what is available.

I quite agree with Dr. Meyer and Dr. Elias that some mothers will drive you crazy. In such instances the mother may be not only of no assistance, but will interfere with your efforts. Certainly in such instances you will make much more progress with the child in the hospital. There are other instances where the attention of the mother is a very valuable therapeutic aid. You will recall Dr. Chapin's system in caring for dependent infants in New York City. About eighteen years ago he first called attention to what all of us are now very familiar with. He found that the mortality among the institutional infants was as high as 80 per cent. He realized that although these infants were scientifically fed there was something lacking. Hospitalization can be blamed, but he believed that it was the lack of mother love and care which these little dependents craved. He started what is now known as the Speedwell system, which in brief is nothing other than using the funds which ordinarily go into the construction of an elaborate building to defray the expenses of placing these infants in homes. He arranges with mothers in the smaller towns in New Jersey to take one of these motherless infants into their homes during the early months of their lives. He allows the mother about a dollar per day, furnishes milk, services of a physician and a visiting nurse and all clothes. The nurse has the supervision of about ten babies in a community and she sees each one every day. In fact, every service is furnished the baby excepting the mother care which the good woman who takes the baby in furnishes. In this way he reduced the mortality to about 18 per cent. Very frequently the baby never leaves the home, but is adopted by the mother who takes it, although she may have children of her own. Who, then, can doubt that mother love and home environment are valuable therapeutic adjuncts to scientific care? Of course, there are instances where hospital care is needed, but babies require mothers just as all little animals do.

Dr. H. Leslie Moore, Dallas, Tex.—Regardless of what our opinion is regarding treatment in the hospital or in the home, 99 per cent of the children are going to be treated in the home. Therefore it is our duty to perfect our care of children in the home. One of the great troubles is the lack of confidence of the mother in her ability to handle the sick child, because of which she seeks the council and guidance of neighbors

and relatives. Every doctor should be a teacher. If he is not a teacher he should not be allowed to practice medicine. Now, teaching medical students is a small end of the teaching problem. The big end of the teaching problem is teaching the laity, particularly the mother. Almost every mother, especially the young mother, lacks that knowledge and if we sit down and explain to her the simple treatment we would have her follow, tell her what we are trying to do and what this particular treatment is for, and assure her that she is going to know more about this child than any of the relatives or neighbors, we quickly establish confidence in her of her ability to handle the condition. If we took the time and prepared ourselves to teach these mothers, the difficulties in home treatment would be very materially decreased.

Dr. A. J. Waring, Savannah, Ga.—When the patient comes to the doctor, whether he be a pediatrician or a general practitioner, it is important for him to eliminate temporarily all thought of outside assistance in the case. That is the great danger of the over-refinement of group work. I have watched a great many men in group work and the psychology of group work is this: The examiner looks at the child's mouth and says "The dentist is going to give me a full report." He goes over the lungs and says, "The x-ray man is going to tell me all about the chest." Dr. Christian, of Boston, referred to the dangers of this years ago. When a child comes to you, forget there are any other children in the outside office and say, "By my knowledge and my experience I am going to make a diagnosis of that child's condition regardless of any laboratory assistance later. Then we will never do slovenly work."

Dr. W. A. Mulherin, Augusta, Ga.—The question of "home vs. hospital treatment for babies and children" should be decided on the basis of what is best for the little patient. Personally, I find myself each year sending more babies and children to the Children's Hospital. In the discussion I think it makes a difference whether it be a children's hospital with nurses trained in pediatric work or a general hospital.

I cannot agree with Dr. Zahorsky that the mother is a better nurse than the well-trained nurse for children. Every child will presume upon mother-love, with the result that nourishment will oftentimes be neglected, and frequently the physician's orders will not be carried out. Also, does it not appear logical to believe a children's hospital nurse can more intelligently care for a sick baby or child than the mother?

It is my opinion a pediatrician can more effectively and successfully render his services when he has at his command the conveniences and help of a children's hospital. For instance, in cases requiring lavage or gavage, saline hypodermoclysis, proctoclysis, intraperitoneal solutions or intravenous work. I agree with Dr. Zahorsky that a baby or child does better when the mother is with them. At our Children's Hospital in Augusta, Ga., we do not separate them, except in the wards, and then only from necessity. However, we do find it necessary to give instructions to the mother, these instructions being to fill the mother's part and not endeavor to serve in the nurse's role. It is our belief that we get better results when judicious treatment is reinforced by mother's love.

Dr. N. C. Womack, Jackson, Miss.—The chronically ill baby should be treated at home. The acutely ill baby has done better and has given a higher percentage of cures in the hospital. I will not say a general hospital, but rather a children's hospital or one equipped to take care of children. In the first place, the acutely ill baby presents diagnostic difficulties. At home you will not have the same opportunity to make the various examinations that are necessary for a diagnosis. Then the question of saving time for the doctor, the question of better diagnostic service for the baby, the question of saving expense for the family should be considered. I live in Jackson, Miss., and I am speaking from the standpoint of a Southern practitioner. An acutely ill baby requires a trained nurse. If you have one, she will work only twelve hours, so you will have to have another nurse. The expense of the proposition is cut in half by the baby's going to the hospital. In our hospital we do not take the baby unless the mother comes along.

Treatment of the acutely ill baby to give the best service and save time, at the lowest expense, can be accomplished better in a well-equipped hospital than anywhere else.

Dr. Zahorsky (closing).—In industrial camps where the people have no homes the hospital is the only place. There is no argument about that. I believe people who have homes, and five or six rooms is what we call the average American home, can take care of their children at home. Of course where they have only one or two rooms and five or six children, the children do better in the hospital. We should bear in mind in treating children to make our work efficient even in the home. I believe it is possible to treat anhydremia at home. If we want to give an intravenous or an intraperitoneal injection it can be done successfully at home. It is probably better to send the baby to the hospital. But what does that mean? It means that somebody has failed in the home. The child should not be allowed to get into that anhydremic condition. If the child has vomiting and diarrhea, you want to use other measures to stop the vomiting. Out of 100 cases which we treated last year, we had only one where we thought intraperitoneal saline injection should be given. One or two other cases were given a few cubic centimeters of Ringer's solution. To all the other cases we gave plenty of water in the home. If those cases had been watched carefully in the home to see that the child got plenty of water, there would probably not have been more than two dozen cases in the hospital. It is the same way with diphtheria. If a child gets diphtheria and you treat the disease promptly you do not have to send it to the hospital two

days later for intubation. You do not then get laryngeal stenosis sufficiently to need hospital treatment. What we need is efficient, prompt service in the home.

Diagnosis in the home must be improved. We are trying to get a microscope made of such a size that it can be carried around, so that we can set it down by the bedside and look at the leucocytes. I would like to be able to look at the urine at the bedside if this were possible; also to look in the stool and see if there is pus. That is what we call laboratory technic in the home. That should be developed, and I hope that it will be. All chronic cases, of course, that need extensive study are sent to the hospital, but we should be able to study them at home. There is a tendency in this country to try to make the hospital the great ultimate career of all doctors. I am not speaking of other departments of medicine, but in pediatrics that is not practicable.

THE NEGATIVE WASSERMANN IN DERMATOLOGY WITH A REPORT OF CASES*

By I. L. McGlasson, M.D.,
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In this paper we are not discussing the different technics of doing the Wassermann reaction, but are confining our remarks to cases with dermatological lesions in which a negative Wassermann has been found, and upon such laboratory reports the diagnosis of syphilis was excluded and some other than antisyphilitic treatment was instituted.

All our serological work is done by Dr. Stout's Laboratory, and in order to make the paper clear I am giving his technic, which is as follows:

WASSERMANN TECHNIC

Reagents

No. 1—Anti-Sheep Hemolysin

Prepared by injecting rabbit intravenously with washed sheep cells. The titre should be 1-2000. Two units are used in the test.

No. 2—Complement

Guinea pig serum used fresh and used in amounts of two units of a 1-10 dilution.

No. 3—Cell Emulsion

Sheep cells are washed three times in normal saline and used in 5 per cent emulsion.

No. 4—Antigen

Two antigens are used.

No. 1 antigen is made from crude alcoholic beef heart extract reinforced with 0.2 per cent cholesterin.

No. 2 antigen, the acetone insoluble extract of dried beef heart muscle after the method described by Neyman and Gager. This is also reinforced with 0.2 per cent cholesterin. These antigens are used in such a strength that four times the daily working unit will not inhibit hemolysis.

No. 5—Patient's Serum

Is inactivated at 56° C. for 15 minutes and used in quantities of .05 c. c. in the test. In setting up the test one-fourth quantity of the original Wassermann is used.

Method.—All glassware is washed with soap and rinsed thoroughly with running water and then sterilized in the hot air sterilizer for one hour.

In the morning of each test the complement is titrated against two units of hemolysin. The test is then set up, adding the complement last, and placed in the ice box for two hours. It is then put in the water bath at 37° C. for thirty minutes and then the hemolysin and cell emulsion are added. It is replaced in the water bath and the results are read as soon as the negative control shows complete hemolysis. In each test in the negative control a serum control tube is used and two tubes are set up for each antigen, the first of which contains four times the working unit and the second tube the daily unit. In the positive control the first tube is the serum control and two antigen tubes are used, each containing half the daily unit. In the test proper four tubes are used, the first of which is the serum control; the second tube receives no hemolysin, but after the two hours in the ice box receives the unit of cell emulsion and is used as an index of the natural hemolysin. If there is sufficient natural hemolysin in the serum none is added.

The third and fourth tubes are the antigen tubes. The Neyman and Gager antigen is more sensitive than the crude extract and when it gives a stronger reaction than the other, the result is indicated as less than a four plus according to the degree of hemolysis in the first antigen tube. Where both tubes show complete binding of complement, result is indicated by a four plus. A three and a four plus is regarded as diagnostic, while a two plus and down to a plus minus is interpreted according to the history of the case.

It is well known that many cases of neurosyphilis will give a negative Wassermann at times, but they are excluded in this report because of the fact that dermatological lesions are open to inspection and their diagnosis should be much easier than the cases in which the objective symptoms are not prominent. Furthermore, we are not making any comparison of laboratories. All the cases here reported were sooner or later found to be positive com-

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plement fixation tests in this laboratory, which, it would seem, is using a more sensitive technic. But, for the purpose of study of syphilis and the application of sane principles in the diagnosis of syphilitic lesions, we are reporting cases in which some laboratory has gotten a negative Wassermann and treatment instituted on a negative diagnosis.

The evaluation of a negative Wassermann, even though done in the best laboratories, is not properly appreciated. From the one who believes that a negative Wassermann means exactly nothing to the other extreme to whom the negative Wassermann means the absolute exclusion of syphilis is a far cry and their positions are equally untenable. There is, however, a happy medium that is both safe and scientific.

I would like to suggest that the Wassermann reaction should never be resorted to until after your case has been thoroughly studied clinically; then call on the laboratory for confirmation. After several years' experience in the study of syphilis I believe that any clinician, studying his cases thoroughly, can check up most laboratories regardless of whether he is familiar with the Wassermann technic or not. I don't mean to say that a man will be a hundred per cent perfect clinically, nor does anyone admit that the laboratory is a hundred per cent perfect. But the cases here reported and many more that could be cited must prove one thing: that the physicians are not studying their cases clinically. The above plan of making clinical studies and a working diagnosis from your clinical symptoms before resorting to a laboratory will prevent you from getting a bias in favor of or a prejudice against a diagnosis of syphilis. The oft-repeated dictum of Sir William Osler that "The laboratory is an addition to but not a substitute for clinical diagnosis" should be constantly before us in this, as any other branch of clinical medicine. Nor is this a criticism of the laboratory. No laboratory worker wants to shoulder the responsibility of diagnosis. He is simply a cog in the machinery, albeit an important one. He should not be made to shoulder the whole responsibility of a given diagnostic point.

Laboratory reports are only symptoms and should only be so considered. It is obvious that more consideration is given to some symptoms than others, but no one symptom should outweigh all others.

It has been questioned that the syphilitic has profited by the modern advances in syphilis and we must admit that certainly, in many cases, he has not really benefited. The discovery of the Wassermann reaction, the discovery of the casual organism spirocheta pallida and the discovery of the arsenicals in the treatment of syphilis may be considered the renaissance of syphilis. But, except in very few instances, we have not advanced beyond the wonderful work of Fornier, Jonathan Hutchinson, Morrow *et al,* who were not in possession of these aids.

I do not mean that there are not many workers in the field of syphilology who are making an intelligent use of all three of these wonderful aids, but many are not, with a result that the syphilitic problem as a whole does not seem to be any nearer a solution than it was two or three decades ago.

It is estimated that there are fifteen million syphilitics in the United States. This being the case, then, it behooves everyone of us to be on our toes on this important subject. It is, then, to the one defect that has come to my notice repeatedly, the negative Wassermann, that I am addressing my remarks today.

A letter in the *Archives of Dermatology and Syphilology,* 1920, page 194, is worthy of perusal by everyone interested in this subject. In this letter Dr. Highman says pertinently many things that should be understood in regard to the negative Wassermann. Briefly, he concludes that the negative test means, first, absence of the disease; second, latency; third, recovery; fourth, a period too early in the initial stage for the formation of antibodies; fifth, deficiency in immunization. It is well understood by all that the complement fixation test for syphilis is resistance reaction and not a specific reaction to the spirocheta pallida. Therefore it follows, if there is nothing to resist there is no stimulation to the production of resist-

ance. All this contemplates that the most sensitive tests for syphilis are being used.

In passing I will say that there seems to be no reason why every laboratory should not be able to do the most sensitive tests in the serological study of syphilis. The voluminous writings of Kolmer and many others certainly are available to everyone. We must admit, however, that many laboratories are sleeping on their rights and are not doing real scientific work.

However, the fact that they are making negative Wassermann reports, and these reports are being accepted as true and acted upon by too many clinicians, goes without saying.

The letter above referred to was an answer to the article appearing in the *Archives of Dermatology and Syphilology* in 1919, page 754, by Lisser on "The Tyranny of the Wassermann Test." His strictures in some instances are quite true and we should not allow ourselves to become the slaves of any procedure.

Use it for what it is worth in conjunction with the clinical findings. As dermatologists you would not dare to overlook a case of scabies on any person with a positive Wassermann reaction. That he has syphilis we will admit, but that he also can have scabies we also must know, and likewise many other things that can happen and do happen in conjunction with a positive Wassermann. The syphilitic with a positive Wassermann is not immune to anything on earth except syphilis and is therefore the same as any other human being as far as contracting any dermatoses. The converse of the above is true in the negative Wassermann. The Wassermann reaction is not 100 per cent reliable as yet.

It follows, then, that laboratories whose technic is not so sensitive and whose tests do not measure up, are going to get a higher percentage of negative Wassermanns in positive cases than the more advanced laboratories. It must be also admitted that many physicians in the country do not have laboratories of sufficient ambition to keep up with the newer technics of the Wassermann reaction. It also follows that many physicians are careless about the laboratories to which they send their Wassermann work. They have been accused at times of sending their Wassermanns to laboratories who specialize in positives. It is well known that many laboratories have a higher percentage of error than others. The physician should be as careful in sending his cases to such laboratories as he would be in selecting drugs for administration to his patients.

From a rather large list of cases I have selected the following twelve as examples of negative Wassermann cases that I have come in contact with. This could be extended much further, as a large experience in the army has shown altogether too many missed cases. For instance, we had 167 cases of neurosyphilis admitted to one hospital. These cases were passed by many boards and were missed. A very high percentage of them had no knowledge that they were infected with syphilis. Many of them gave histories of blood examination, some of which, although indefinite, must be accepted as having been done in good laboratories. Therefore, it is not unreasonable to expect that many cases of syphilitic dermatoses can be and are missed.

Case I.—A banker, age 30, from a town outside of San Antonio consulted me with a lesion on his chin (Fig. 1). The lesion had existed for

Fig. 1.—Negative Wassermann relied on. Case was x-rayed.

a period of one year and had no subjective symptoms, the only symptoms being objective. There was no pain, itching or tenderness or any other disturbing factors except the looks of the thing. He thought it had developed from an in-

fection in the barber shop; however, he had a perfect history of some ten years before having a penile lesion. He was rather an intelligent man and I think his history was quite accurate. He tried numerous salves and finally consulted a physician, who had a Wassermann made, and it was negative. He then diagnosed it malignancy and treated him with heavy doses of x-ray, so that when he presented himself the beard was completely epilated around the lesion and there were considerable evidences of atrophy from the excessive x-ray therapy. The lesions were slightly raised and were inclined to be discrete so that a differentiation between lupus and syphilis was necessary. However, deep in the skin could be felt distinct nodules that had all the appearances of a gumma. In our laboratory we got a 4 plus Wassermann and the lesion was well in some three weeks. This man's age, the action of the lesion and the appearance of the lesion was such that I feel that any dermatologist could have recognized the case. This physician, who is a general practitioner, missed it purely and simply by relying on his Wassermann reaction.

Case II.—A man aged 26, married, with one child, presented himself with a lesion over the right eye extending down to the bridge of the nose. This lesion was red and hypertrophic, raised above the skin, thickened and markedly indurated. It gave no subjective symptoms and he was at a loss to know how it came and when. He insisted that he had had no infection of any character on his penis and that he had had nothing that would ever indicate to him that he had had syphilis. He even denied gonorrhea. The length of time that this lesion had been there, the fact that it did not ulcerate, the fact of its being a hypertrophic raised, red lesion gave no other suggestion to my mind than syphilis. He told me that he had had two blood tests made and they were reported to him as negative. Cancer was suggested to him and he came to me primarily for radium. We were able to get a one plus Wassermann in his case. This, in conjunction with the clinical symptoms, confirmed a diagnosis of circinate nodular syphilide. A therapeutic test proved our diagnosis to be correct. This man was a man of quite a high grade of intelligence and before his marriage had himself investigated and insisted that the lesion was there when he consulted a physician. Of course, the oft-repeated story of the infected mother and child are things to take care of in the future, all of which could have been obviated if he had had a real clinical study of his case.

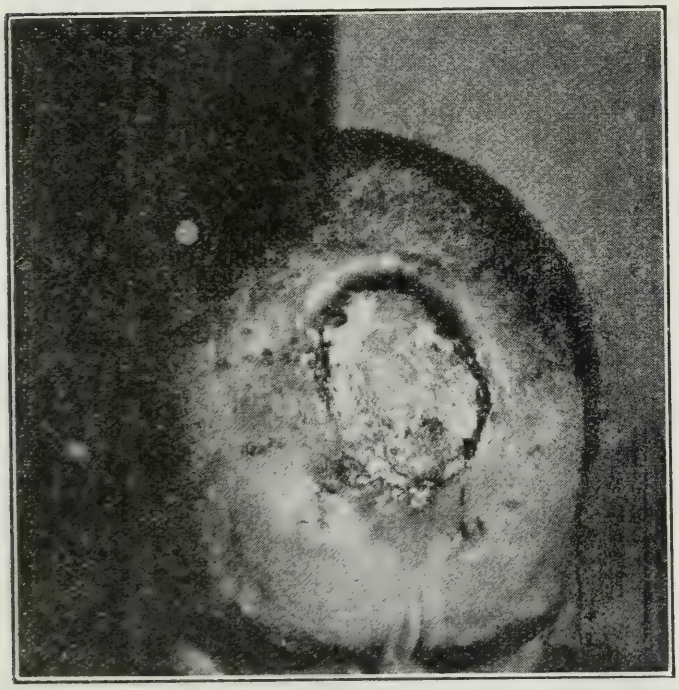

Fig. 2.—Destruction by cancer paste applied on what was probably a gumma.

Case III.—This was a man aged 46 (Fig. 2) and one of the most interesting cases of the series because he came through a splendid hospital in another town in the State. This hospital is connected with a medical school. The character of the original lesion was a bit indefinite and was very hard to describe because it had been destroyed and I have only an indefinite description of it. The lesion began at the edge of the hair. It was treated in various and sundry ways by several physicians, some of whom were on the right track, but failed to push their advantage. One prescription he had was for potassium iodid from a physician who was on the right road, but weakened on his diagnosis and failed to push his treatment. A diagnosis of malignancy was made and operation was refused, the patient leaving the hospital, going back to west Texas, his home. There he fell into the hands of the paste artist, who put a cancer paste on his forehead and lifted all the soft parts, down to the bone, as you will see in this picture. When he presented himself at our office the bone was highly necrotic, very offensive in odor and pulsation of the dura could be plainly seen at several points.

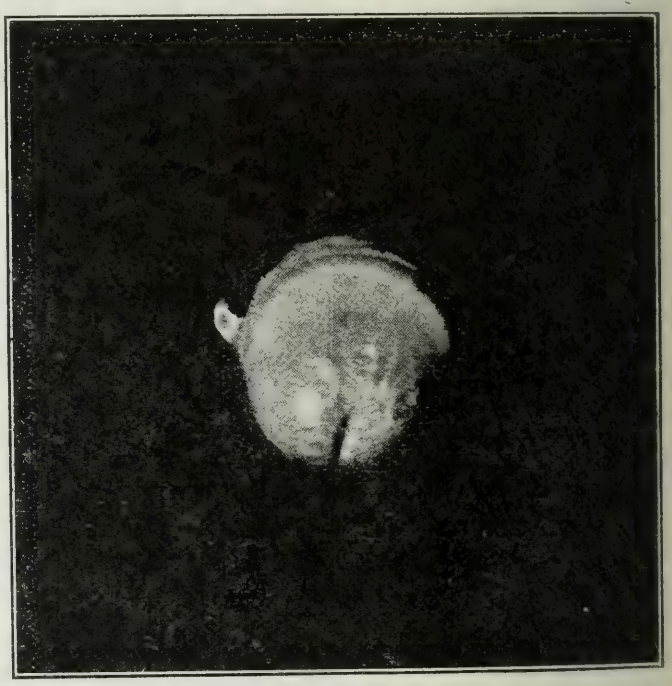

Fig. 3. Case 3.—Penile chancre scar.

It should be understood that syphilis was not the cause of all the damage. The cancer paste, which caused the necrosis of all soft parts, is the prime factor in the damage, you see. In the slides also I am showing a scar on his penis (Fig. 3). It would seem that the trouble in this case, notwithstanding the negative Wassermann, was failure to examine the patient. How anybody could overlook a scar as big as a nickel on the head of the penis can only be answered by failure to examine patient. This man gave a definite history of the sore, which he describes very accurately as being a hard chancre, and he had possibly a secondary eruption, but he was very indefinite in his description of it. I, of course, cannot say what happened in his examination at the hospital, but he did not attempt to keep anything back from me. He answered every question frankly and openly without any hesitation whatsoever. In this case we got a 4 plus Wassermann and the man is now under anti-syphilitic treatment.

Case IV.—A lady aged 42 came to me with a tumor-like growth over the bridge of the nose extending down towards the inner canthus of the

Fig. 4.—Lesions confined to elbows and knees.

eye. She was sent to me for radium with a diagnosis of carcinoma. I did not like the appearance or history of the cancer lesion. It had all the clinical appearances of a gumma. There was no ulceration, simply a raised, hard, nodular lesion of six months' standing, giving her no pain or trouble of any character. In this patient we got a 4 plus Wassermann and got a 4 plus Wassermann on her husband. She had had two negative Wassermanns. Anti-syphilitic treatment cleared up the lesion promptly. Incidentally, I had a rather difficult time explaining to the doctor why I did not use radium and protect him.

Case V.—A woman aged 33 is a very interesting case. She came to me with the lesions on knees and elbows as you see (Figs. 4 and 5). She had a diagnosis of psoriasis and had been treated over a period of some six years by various men. Among the list that she named were some very good men, two of whom were dermatologists. She had had a blood test made on two occasions, and one man had gone so far as to give her one dose of arsphenamin notwithstanding the nega-

Fig. 5, Case 5.

tive Wassermann, but quit at that point. The character of lesions is best shown by the picture which, while though located on areas that are usually favorable sites for psoriasis, still had no earmarks indicating psoriatic lesions. They were red, raised lesions; there was no scaling, but were crusted and, as you see, many of them were actually ulcerated. In fact, the scarring has been intense in this case, particularly on the elbows, and prohibited the lady from wearing evening clothes. She was a singer and this was quite a defect. We had no difficulty in getting a 4 plus Wassermann in her, her child, and her husband. The lesions are all healed, but the scars are very markedly in evidence.

Case VI.—A woman, aged 28 (Fig. 6), had a beautiful syphilitic lesion. This was made up of

Fig. 6.—Lupus diagnosed because of lung findings and negative Wassermann.

a large flat lesion with a segmented border, a typical squamous serpiginous syphilide. You see the remains of many circles which were swal-

lowed up in the main big lesion, but left a segmentation around the border of the lesion. This lesion was diagnosed lupus, as a focus of tuberculosis was supposed to have been found in the upper part of the right lung. It had no evidences of lupus; it was not ulcerated and the area involved was very unusual for lupus, no other evidences of lupus being found. This patient had a plus minus in our laboratory and a negative before. However, the picture I submit to you is indicative of nothing less than a tertiary syphilide. The patient promptly was relieved of her superficial syphilis within three weeks and we have succeeded in getting two consistently negative Wassermanns at the present date.

Case VII.—A man aged 44 came to me for a radium treatment for epithelioma in front of the left ear (Fig. 7). This was an ulcerated lesion,

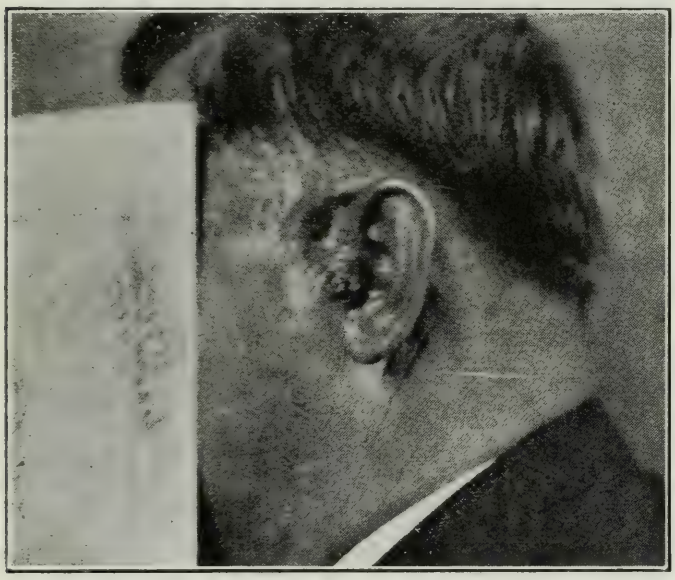

Fig. 7.—Cancer diagnosed because of negative Wassermann.

but it was spreading peripherally and not deeply penetrating. While it was destructive, still it was not in that peculiarly destructive manner shown in epithelioma. There was no corona and very little other evidence to support the diagnosis of cancer of the skin. His father was a doctor and he was very positive that he could not have syphilis and had had some blood tests made, all of which were negative. However, he gave a satisfactory history, although indefinite, of a lesion when he was nineteen. He has since married, had one child, and no miscarriages. We got a 4 plus Wassermann in the man, in the daughter, and in his wife. The lesion promptly healed under anti-syphilitic treatment.

Case VIII.—A man aged 35 had a very interesting lesion on the back of the hand markedly indurated, raised, in fact, a discrete nodular syphilide (Fig. 8). The patient, a citizen of Ohio, was sent to San Antonio for a possible tuberculosis of the lungs. Tuberculosis of the lungs was never substantiated and the only thing we could find was a large number of mediastinal glands. This lesion looked not unlike a lupus vulgaris and the diagnosis was quite difficult clinically. It was one of those cases in which, if the laboratory had failed us, we should have had to resort to a therapeutic test to prove it. With a history of tuberculosis before us, the appearance of what could be very easily accepted as apple-jelly nodules, but which were simply

Fig. 8.—History of the confused diagnosis.

gummata, would have been ample excuse for a failure to make a diagnosis. However, we got a 4 plus Wassermann after two tests. The first one was a slow negative, but the next one was frankly positive. In the meantime, the laboratory had checked up the antigen and made a new titration with the result that the second test was 4 plus. Treatment cleared up this lesion and the gentleman went back to Ohio, to his home, and resumed his normal occupation.

Case IX.—A man aged 48 had a lesion over the left eye which spread down over the eyelid and involved the cornea and iris (Fig. 9). Vision was rapidly being destroyed in that eye. The lesion was spreading peripherally and segmentation was not dissimilar to the lesion shown in

Fig. 9.—Had three blood tests—all relied on.

Case 6. The patient gave a history of having seen twenty-six physicians in his rounds and having had three blood tests. At what laboratories, I could not determine. He gave us a 4 plus Wassermann. The lesion, as you will see in the cut, could suggest nothing else than ser-

piginous nodular syphilide. It does not appear to me that there could be any differential diagnosis in this case and Case 6. This man made an uninterrupted recovery, and aside from some scarring, vision was very nearly as good in the left as in the right eye. None of the scarring was necessary, however, as the clinical evidences of syphilis should have been recognized, notwithstanding the negative Wassermann.

Case X.—A woman aged 42 is another case in which the lesion is a nodular syphilide located over the bridge of the nose. In this case it was ulcerated. Here there was some justification for the consideration that this may have been an epithelioma. This patient, however, gave marked evidence of neurosyphilis, and as she was separated from her husband, things pointed to irregularity that could easily account for a syphilitic infection. She was so nervous that she simply

Fig. 10.—Sporatrichosis vs. syphilis. Two negative Wassermanns.

would not submit to a photograph. As was stated above, there were considerable family difficulties and evidences that the husband had been sick. As to the nature of his illness we got no clear history, but it could be easily suspected that he had had a syphilitic infection. This lesion was painless, gave no symptoms whatever except the objective ones and the disagreeable discharge from the ulceration. She gave a history of a pitched battle at home, in which she was struck over the eye. This could easily account for the ulceration, although ulceration of a gumma is not rare. She gave a 4 plus Wassermann and therapeutic tests proved it. The lesion was entirely healed within a period of four or five weeks.

Case XI.—A negress, aged 56, presented herself with lesions of the nodular ulcerative type on the back of the hand (Fig. 10), extending up the arm, with only one hand involved. She thought that she had been infected in washing clothes. A diagnosis of sporotrichosis had been made, although this could not be demonstrated microscopically. She had had two blood tests according to her own statement and the doctor said that she was all right. We succeeded in getting a 4 plus Wassermann and her lesions promptly healed under anti-syphilitic treatment. We did not give potassium iodid, so the fact that potassium iodid will cure sporotrichosis did not enter into this case.

Fig. 11.—Late syphilis not uncommonly gives a negative Wassermann.

Case XII.—A man aged 36 presented himself with ulcerated lesions on the legs (Fig. 11). These were deep, punched-out ulcers and in those that are healed you will notice a very sharp, precipitous edge. Those lesions that were ulcerated were quite pustular. The Wassermann was negative. The history was negative at this time. The lack of pain suggested syphilis. There were no varicose veins. He claimed the lesions came from injuries. It may be because of no better answer that a diagnosis of syphilis was made and treatment instituted with a result that his leg was completely healed in one month. We then got a faintly positive Wassermann. It could be termed a one plus. At this time the man voluntarily admitted the fact that he had had a chancre on his penis, which he denied at the first examination.

This peculiarity of the syphilitic in denying infection or an opportunity for infection is well known to all of you. It is one of the mysteries in the psychology of syphilis that I cannot very well explain.

These twelve cases could be multiplied several times and certainly could be widely extended if we include neurosyphilis in this paper. We purposely did not do so, because all the evidences in these cases are laid out before us. It required only a reasonably intelligent knowledge of syphilis to work out our cases. It would seem that such mistakes as we have pointed out should not be made. We all welcome the laboratory as an aid in our efforts of diagnosis, but the laboratory is only one aid.

It would seem from a study of the above cases that the general practitioner does not, nor should he be expected to, know all that there is to be known about dermatology. It is strange, however, that with

so many good syphilographers these cases are allowed to drift on with no help whatsoever. Eight of the twelve cases reported were referred to me. The other four came in voluntarily. As you will note from my report, however, they were not referred to me for their syphilis, but for an entirely different condition.

It would seem from the above that we have obtained a very high percentage of positives in these cases, notwithstanding the fact that other laboratories have obtained negatives. We are attempting to keep our laboratory up to the highest standard. There is nothing that we are doing that every other laboratory in the country cannot do if it so desires. The literature is full of criticisms and suggestions in the Wassermann technic and tests made over many thousands of cases, particularly during the army work by men devoting their time to this work, indicate that there is something amiss. And the laboratories who may fall under criticisms in this paper can get out of that class by simply studying their work and perfecting their technic.

Standardization of the Wassermann technic is "a consummation devoutly to be wished for," but that can only come when laboratories are made to understand that their work must stand up. When they do so understand they will try to come as near to perfection as possible.

MALARIAL NEPHRITIS

By Moise D. Levy, M.D.,
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In the routine general physical examination of the patient, one is impressed with the rather frequent findings of a chronic nephritis. Some years ago this was looked upon as a natural result of the more or less frequent mild epidemics of scarlet fever and diphtheria which were a good deal more prevalent than at present with our saner quarantine measures. More recently the attention of the examining physician has been centered on focal infections as an explanation of nearly every obscure chronic ailment with which the patient may be suffering. This intensive search for some such focus has resulted in much benefit to both the patient and the physician, but it would appear that in such a search we have been prone to overlook (in this climate at least) some of the more common and usual illnesses which may leave as sequelae a distinct chronic infection of the kidneys.

The occurrence of albumin in the urine has been a common accompaniment of malarial infections, having been noted and described in the earlier writings of this disease. Laveran states that

> "Acute or chronic nephritis is a fairly common complication of paludism. The nephritis has sometimes the characteristics of an epithelial nephritis (the urine contains albumin in great quantity, anasarca occurs and becomes rapidly generalized), sometimes those of interstitial nephritis or of mixed nephritis. This last form is, I believe, the commonest."

Before the American Association of Physicians in 1898, Thayer presented a most complete paper on "Nephrit s of Malarial Origin," reviewing in some detail the literature extant at that time. This report, embracing a study of 691 cases of malarial fever, attempted to determine:

(1) The frequency of albuminuria in malarial fever as compared with other acute infections;

(2) The frequency of acute nephritis in malarial fever; and

(3) The possible influence of malarial fever in the production of chronic renal changes.

In the entire series of 691 cases, albumin was found present in 321, a percentage of 46.4; no albumin was found in 370, or 53.5 per cent. Casts of the urinary tubules were present in 121 cases, or 77.5 per cent. In dividing the cases according to the type of infection, it is both interesting and instructive to note the large percentage of aestivo-autumnal infections presenting positive findings in the urine.

There were 352 cases of benign infections, 8 quartan cases being included, and 283 cases of aestivo-autumnal infections. In the benign group as compared to the malignant or aestivo-autumnal group, albumin was noted present in 38.6 per cent as against 58.3 per cent in the latter group. No albumin was found in 61.3 per cent as against 41.6 per cent. Casts were noted in 12.2 per cent as against 24.7 per cent.

A large series of typhoid, scarlet fever and diphtheria infections were analyzed to determine the percentage of cases in each infection showing albumin. In the typhoid group there were 78 per cent, in the scarlet fever group 49 per cent, and 57.7 per cent of the cases of diphtheria. Compared to the 58.3 per cent of the cases of aestivo-autumnal infections showing an albuminuria there is seen to be no great difference from the findings in the common acute infections. In 76 cases of malaria which we analyzed albumin was noted present in 27.6 per cent and casts in 25 per cent.

The acute nephritis of malaria is rarely immediately fatal. It seems to occur with somewhat greater frequency in the negro race, but there is nothing distinctive in the clinical characteristics of the disease. The usual features of an acute toxic nephritis are found and the tendency is apparently toward a short course and a favorable issue.

In the wards of the Johns Hopkins Hospital, Thayer found an acute nephritis in 4.7 per cent of the aestivo-autumnal infections and in 2.3 per cent of all the cases treated. Marchiafava and Bignami state that

"As to the pathogenesis of the renal lesions in malarial infections, we are at present able only to form theories. The knowledge of the parasite has so far thrown no light on the pathogenesis of the nephritis. In pernicious infections very few parasites are found in the kidneys, even when the changes in the epithelium may be so grave as to lead to necrosis. From this fact we may infer that the lesions are due not to a localization of parasites in the renal capillaries, but to some toxic substance eliminated by the kidneys."

This view was more or less generally held until Ewing reported a case of nephritis with massing of the parasites in the kidney, which would appear to show that malarial nephritis may be caused principally or in large part by the presence of an excessive number of parasites in the renal capillaries. By microscopical studies, Ewing was able to determine three main types of acute renal lesions occurring in malaria. (1) An acute degeneration of toxic origin, often reaching a degree in which exudation of blood serum into the tubules is added. This lesion is respons b'e for the vast majority of cases of albuminuria in malaria. (2) An extreme form of acute degeneration with focal necroses, numerous hemorrhages, and exudation into the tubules of blood serum and blood pigments. This lesion is seen in cases of hemoglobinuric malarial fever and it has not yet been found associated with an excessive number of parasites in the capillary vessels. (3) Massing of parasites in the renal capillaries with extreme degeneration of parenchyma cells, multiple hemorrhages and exudation of blood serum into the tubules. It seems certain that this type of lesion can occur only in severe aestivo-autumnal infections. Ewing has collected anatomical evidence to support his belief that in the pernicious aestivo-autumnal cases the three types of lesions may be variously combined, but he finds no good reason for believing that with the benign tertian infections any other than the first type can exist.

Interest naturally centers upon the possibility of diagnosing this third type of nephritis during life and the diagnostic criteria set forth by Ewing are:

Partial or complete suppression of urine, considerable admixture of intact red blood cells—a considerable proportion of albumin, the presence of many coarsely granular, epithelial and some blood casts, the presence of infected red blood cells, both free and adherent to casts, and of pigmented leucocytes adherent to casts.

The following cases have been selected as representative of the acute and chronic forms of nephritis resulting from malarial infections:

Case I.—A negro, male, aged 25, a common laborer, entered the hospital November 26, 1916, complaining of fever. Illness had started 13 days before with a bursting headache and fever, which had been intermittent.

The family history was negative. From the past history, he had had measles when a child, Neisserian infection about one year previously and at the same time a chancre.

Physical examination revealed a fairly well-nourished negro, with no edema or ascites. Herpes was present on the lips and the spleen was palpable at the costal margin. Examination was otherwise negative. The blood showed red cells 5,810,000, hemoglobin 85 per cent, white blood cells 10,800, a normal differential count, and many ring forms of the aestivo-autumnal type of malaria. Blood pressure was systolic 120 mm., diastolic 80 mm. The urine, examined three times, was pale yellow. Its specific gravity was 1010-08, it was acid in reaction, and there

was no sugar. A heavy precipitate of albumin and on microscopical examination numerous epithelial, blood cells and pus cells were noted. Granular and cellular casts were also to be seen. Shortly after admission the renal function as determined by the phenolsulphonephthalein test was 8 per cent for the two-hour period. The blood urea was 130 mg. per 100 c. c. of blood. The temperature at no time was above normal and the pulse and respiration were also normal. This patient received seven intravenous injections of quinin and urea during his stay in the hospital and was discharged with the blood free from parasites, but with still some evidence of renal irritation as determined by the urinary findings.

Case II.—A young negro boy, aged 13, entered the hospital August 13, 1917, complaining of swelling of the feet, legs and stomach. His trouble had started about the first of August, with chills and fever for three days. The chills and fever stopped and during convalescence, while sitting up, the feet and legs began to swell, the swelling finally involving the abdomen. The family history was negative; past illnesses were measles and whooping cough. Physical examination showed a well-nourished bright negro boy. The feet and legs were greatly swollen, pitting on pressure. The abdomen was protuberant. Dullness was noted in both flanks and a fluid wave was elicited by percussion. A soft systolic murmur at the base of the heart, not transmitted very much in any direction, was heard on auscultation. Examination revealed nothing else of importance. Blood pressure was systolic 124 mm., diastolic 66 mm. Wassermann was negative. The urine was dark-yellow in color, 1020 specific gravity, acid, with albumin, no sugar, granular casts both coarse and fine, hyaline casts and some leucocytes and red blood cells on microscopical examination. Aside from a fairly well marked degree of secondary anemia, red cells 2,900,000, and hemoglobin 60 per cent, nothing was determined from the blood examination. Several smears for malaria were negative. The temperature was of a sub-febrile type, ranging from 96.6 to 99.8°, on only two occasions during the first few weeks in the hospital going up to 100°.

Eliminative measures were instituted during the month of August and the first part of September, with no results, the edema and ascites remaining practically unchanged. On September 26, another smear for malaria showed a few ring forms, diagnosed as aestivo-autumnal type. Malarial treatment was instituted at once, the eliminative treatment being discontinued. The improvement in the physical condition was very marked. The edema and ascites rapidly disappeared and the patient was discharged on October 29, normal in appearance. With the subsidence of the ascites an enlarged spleen was made out, palpable at the costal margin. The urine continued to show albumin and casts up to the time of discharge. A renal function test, phthalein, on October 8, showed a total elimination of 66 per cent, or practically normal. This patient was under observation for several months after leaving the hospital, and while the urinary findings were greatly improved, albumin was still found when he was lost sight of.

Case III.—At about the same time the above case was under treatment a young negro girl about 12 years of age presented herself for treatment. She had had chills and fever and on entrance into the hospital presented a pretty picture of general anasarca. Many ring forms were found in the blood smears and anti-malarial treatment resulted in a rapid disappearance of the edema. Unfortunately the records of the case could not be found, so complete findings are impossible.

The brief reports of these cases illustrate the common types of nephritis met in malarial infections and make the conclusions reached by Thayer applicable here, viz:

(1) That albuminuria is a frequent occurrence in malarial fevers and is considerably more frequent in the aestivo-autumnal infections.

(2) That acute nephritis is not an unusual complication of malarial fever and occurs more frequently in the aestivo-autumnal type, Thayer observing it in 4.7 per cent of the cases treated.

(3) The frequency of albuminuria and nephritis in malarial fevers, while somewhat below that observed in the more severe acute infections, as typhoid, diphtheria and scarlet fever, occurs sufficiently often to give reason to believe that malarial infections especially in tropical and sub-tropical countries, may play an appreciable part in the etiology of chronic renal disease.

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308 Humble Bldg.

TROPICAL DISEASES AND PUBLIC HEALTH

VENEREAL DISEASE CONTROL IN ALABAMA*

By S. W. Welch, M.D.,
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The Bureau of Venereal Disease Control of the Alabama State Board of Health began work in 1918 with practically no knowledge of what the task before it was. We found ourselves upon an uncharted sea. Our preliminary survey disclosed the fact that we were not the worst infected state, but our infection was great enough to make treatment the major activity of the Bureau.

Education and law enforcement have a constantly increasing emphasis in the program, but two facts stand out boldly:

(1) The great majority of infected persons cannot be reached by any educational program yet devised. They will attend neither lecture nor movie on the subject.

(2) If they could be reached by both lecture and film instruction, they would still be without treatment, or any means of securing it, and we have no evidence that the spirochete or gonococcus can be educated out of the human system. These two facts, together with the revelation of the extent of these infections, forced us to place treatment first on our program.

To become effective, treatment must be in immediate reach of all, geographically and financially. Our purpose is, above all others, to stop the spread of infection. The free clinics in the cities solved that part of the problem. The city resident, however down and out, could generally get some treatment. Not so with the countryman. His isolation created a problem within itself. We realized that measures must be found to place adequate and effective treatment in reach of all. We appealed to the physicians to give as honest and careful treatment to venereal troubles as they do to typhoid, diphtheria and other communicable diseases. We then took steps to arouse in the public mind, and in the individual mind, the same "reverence" for gonorrhea that they have for syphilis. We then went after those infected, inducing them to begin treatment, and incidentally we began to educate them. These patients had to be made to see that we were all working together toward two great ends: their cure and the prevention of further infection. The only means of reaching these people with such facts was through treatment.

We now have twelve free clinics in the larger centers, giving more than 2000 doses of arsphenamin and 5000 other treatments per month, and more than one hundred cooperative clinics scattered throughout the State, giving from 600 to 700 doses, either free or at $2.00 per treatment. The new admissions to these clinics have decreased about one-third. Reports of new cases by private practitioners, and of a failing demand for patent medicines from the drug stores, both indicate a decrease in the incidence of infection.

Our educational program has followed rather definite lines of attack:

First, against congenital syphilis through the marriage certificate law. We are making an effort to have all marriage certificates come from the family physician of the bride.

Second, to gain the support of the ministers of the several Christian denominations. We furnish them with information which forms the basis of sermons on health and clean living in clean environment, which they have used with telling effect.

Third, through the federated clubs. These have responded magnificently. They have endorsed all of our public health activities, and especially the proposed State Home for Women.

Fourth, probably the most effective line of attack has been through the schools. The high school boys have been taught: (a) that continence is consistent with the best physical development and the only assurance against venereal diseases; (b)

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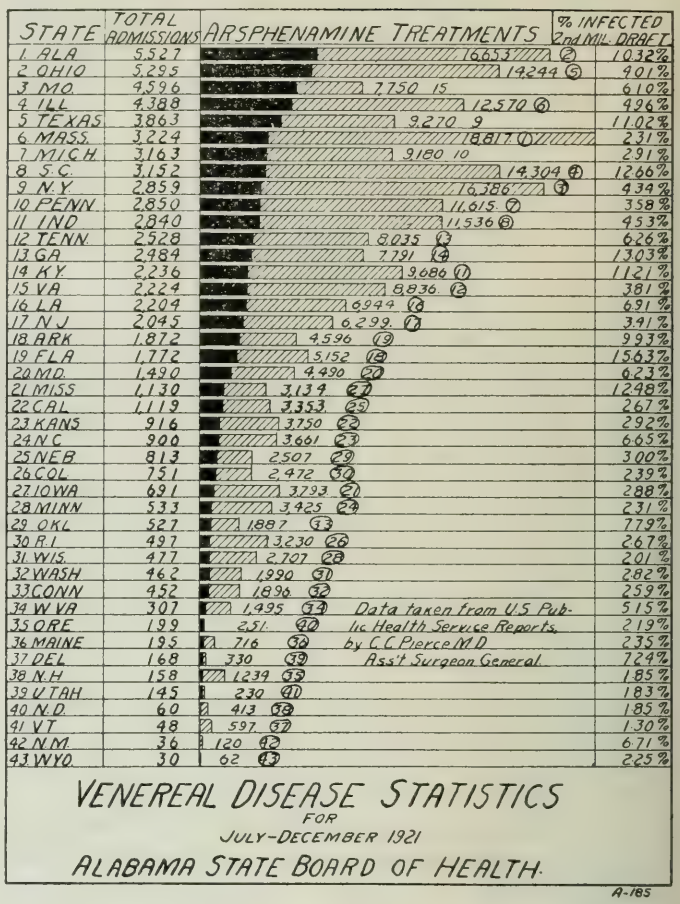
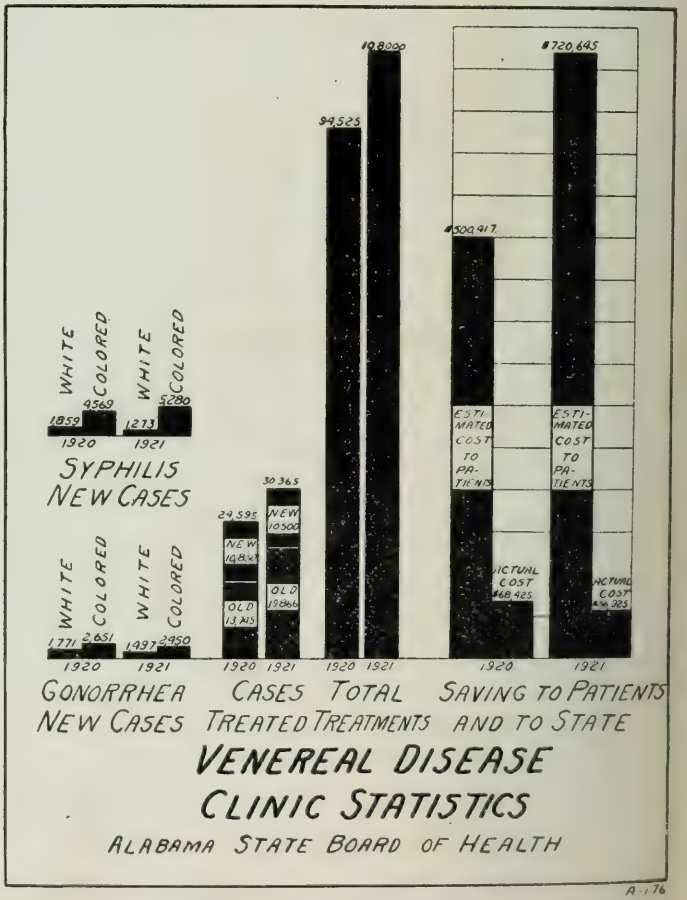
that venereal diseases are the most prevalent of all communicable diseases in the State, and the most serious diseases with which we have to deal; (c) that their evil effects are seldom limited to the individual sufferer and not always to his generation; (d) that there should be but one standard of sex morals for the boys and girls who are to be the husbands and wives of tomorrow; (e) that the body, during adolescence, is dependent upon the secretions of the sex glands for proper development, just as it is upon the secretions of the digestive system; that to rob it of this internal secretion by masturbation or promiscuous sex indulgence may prevent its development into complete and permanent virility even more effectively than to rob it of a proper physical diet during that time.

Fifth, through the employers of labor. We mean by this, not only the factory or shop, but we have taken the farmer who employs a few negroes, the housewives interested in the safety of their family from innocent exposure through syphilitic servants, and any others whose interest in general health makes them listeners. These people have been shown the folly of individuals or communities who raise a howl about foul odors from garbage piles, and ignore, or refuse to see, the gilded and sumptuous resort inviting our youth to ruin.

Sixth and lastly, we have endeavored to make clear to everyone the intimate relationship between physical and mental sanitation. There are dangers long recognized in insanitary environment of home, school, city and country. All admit the possibility of the spread of typhoid fever, dysentery, hookworm and many other diseases from an unclean physical environment. But we are very slow to see that it is even more important that our children have a sanitary mental playground for their idle hours.

We have watched closely for every development under this program. There are two results clearly evident: (a) an open mind among the public, both men and women, and a willingness to learn the facts and face this as a great public health problem; (b) an actual reduction in the incidence of these diseases of more than





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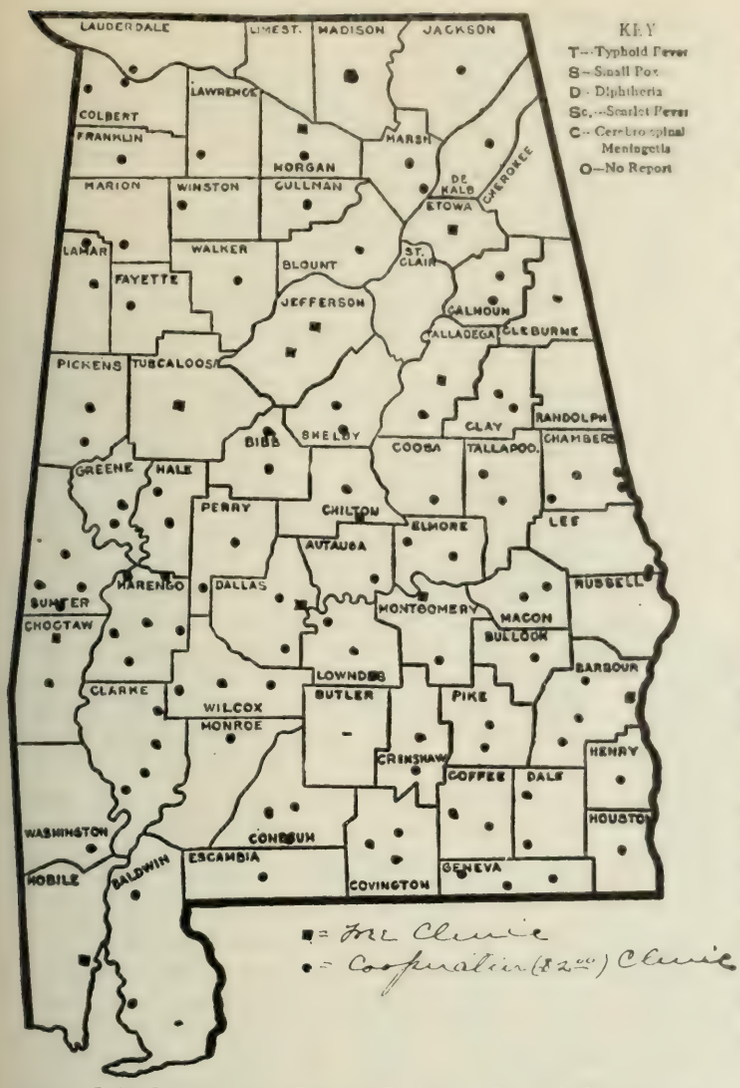

one-third as evidenced by the following figures. Comparing new admissions for the months of July, August and September, 1921 and 1922, we have:

	1921	1922	Reduction, %
New cases of syphilis	2068	1294	37
New cases of gonorrhea	998	708	30
New cases of chancroid	108	34	70

Average decrease, all together, 39%. Number clinic reports used in these computations in 1921 was 137, and in 1922, 172, which is an increase of reporting agencies of 25 per cent and an increase of 25 per cent in territories reported from. Total clinics operating in 1921, 12 free and 80 co-operative; 1922, 12 free and 110 co-operative.

The need for more thorough treatment seems to have been learned, as we gave:

In 1921, 8724 doses of arsphenamin.
In 1922, 8454 doses of arsphenamin.
In 1921, 4.1 average doses per patient.
In 1922, 6.5 average doses per patient.

Attention is directed to the fact that these records come from an increase in territory and a larger number of physicians reporting, and yet a reduction of more than one-third new cases is shown. Reports from physicians in private practice and from druggists confirm our observations.

In the light of these facts, we cannot escape the conclusion that substantial progress has been made in the control of venereal diseases in Alabama.

DISCUSSION

Dr. Joe P. Bowdoin, Atlanta, Ga.—The organization for this work in Georgia is about the same as that of our sister state on the west, Alabama. We have our clinics and about 130 county units.

Education is the surest method of final eradication and our efforts should be to reach the child. The schools will some day take up this important work.

It is important to treat all cases. To do this it must be free to all indigents, and in this class seems to fall a large majority of the infections. The male prostitute should be handled as we would the carrier of any infectious or contagious disease, as, for instance, the malaria carrying mosquito—eradicate the breeding place and screen him out. This phase of our work is neglected. He is responsible for the spread of the diseases. When he comes for treatment he should be taught his responsibility.

The best advertisement of our clinics and our county units is the satisfied patient. All physicians should realize that they are teachers as well as physicians, and, if need be, informers of the law enforcement end. We have found our physicians quick and ready to respond to the work in Georgia.

We agree with Dr. Welch that all organized bodies of men and women should be solicited to join in this fight.

I would especially emphasize what the Doctor says about a "sanitary mental playground" for the young.

We have an open mind so far as the public is concerned, many requests coming from various sources in our State. Especially is this noticeable of parent-teacher associations and women's organizations. We have lectured every high school, as well as female college, in our State in towns of 2000 population, the reaction in all being good.

As for the good we have accomplished and the decrease in the infection, we think it satisfactory. We have only a few sources of reliable information, one of which is our Insane Asylum, which shows 4.5 per cent reduction in twelve months for brain syphilis, which happens to represent a saving in our State of exactly the amount appropriated by our Legislature for the Venereal Disease Bureau.

Our reports, which clearly correspond with

Alabama's, show that for the first six months of 1921 and 1922 we had an average decrease in venereal disease of 25.6 per cent.

	Syph.	Gon.	Chan.	Arsphen.	Wass.	Deten.
1921 . . .	3162	3038	129	14968	10924	401
1922 . . .	2364	2151	188	9084	10560	530
Decrease, cases . . .	798	887		5884	364	
Increase, cases . . .			59			129

Decrease in syphilis, 25.3 per cent.
Decrease in gonorrhea, 29.1 per cent.
Increase in chancroid, 45 per cent.
Decrease in arsphenamin, 39 per cent.
Decrease in Wassermann, 3.5 per cent.
Decrease in detention, 32 per cent.

The State Laboratory for this same period shows an increase of Wassermanns of 15 per cent.

I am inclined to think that the increase shown in chancroid is due to the fact that the Fort Benning Clinic reports all venereal cases as chancroid until they are confirmed by laboratory findings.

Question.—I would like to ask Dr. Welch how reliable he thinks those figures from reports are.

Question.—What is the amount of your budget, and do you furnish free arsphenamin to everyone?

Dr. Welch (closing).—I think the figures on syphilis are fairly accurate. The figures on gonorrhea are not accurate, but they are more accurate for last year than they were the first year, and they show a decrease. The percentage of patients treated coming to the clinic is greater now than it was a few years ago. But my assistant, the head of this department, believes that both are accurate. I do not believe that the gonorrhea reports are as accurate as those on syphilis.

We worked this way: we have in the twelve centers of population a free clinic. From those clinics we have had this marked reduction. I have very frequently said to the chief of this Bureau that the thing looked impossible, but I believe it myself. There is no question that we are covering the territory by these clinics. In Birmingham, in Selma, in Montgomery, in Mobile, in Anniston, in Gadsden, in Huntsville, in Decatur, in all the large centers of population, we have free clinics in the health departments, and in every one except perhaps one or two the incidence of new cases in the clinics shows a decline. In Mobile the clinician rounded up last spring sixty-five women of the underworld and kept them in jail for ninety days, until cured. When he released them he gave them the injunction: "Now, if you get caught any more, come immediately to the free clinic. If you do not, I am going to put you back in jail." That is how this reduction has come about. Montgomery, Birmingham and Mobile are the places where the reduction has been brought about, and it has been brought about by the reduction in the infection among prostitutes.

I believe our most effective measure is education of high school boys. Though this statement may provoke a smile, I am confirmed in the conviction that the high school boy (everyone of whom has been reached in Alabama) is not exposing himself as high school boys did in other days. They are not taking the chance. The appeal is to their higher sensibilities, that they are to be the fathers of the next generation, and that they have not the right to expose themselves in such a way as to transmit a transmissable disease to their offspring, and it has gone home to them. We have put in the hands of the father of every high school boy in Alabama the pamphlet, "Keeping Fit," and have asked the father to read it and, if he approved it, to give it to his boy. If we get a response from that, then we follow up with literature to the boy. The Director of this Bureau is a school teacher and he understands the psychology of reaching the young mind. He has talked from once to twice to every high school in the State of Alabama during the school year. He is a most enthusiastic man, and to him almost alone is due this magnificent piece of work.

We spent $40,000 of the State's money and $50,000 from the United States Government. That is gradually increased. If we get an increased appropriation from the State, that will go up, too. This cooperative work is the key to the situation. Doctors were chosen by the medical profession of their county and recommended to the Health Department, and they have been appointed to represent the State Board of Health in their county or in their immediate community. They are chosen by the local profession. In the small towns of 1500 or 2000 we have a man. We furnish the material, the office equipment, the arsphenamin, etc., and he treats the patients for two dollars per visit. They do not all come back, but they will come for three or four treatments. Any planter in Alabama will put up six dollars to get his negro treated, and when he does that, that case is non-infectious for the time being. He is not cured, but he does not spread the disease. The same thing is true of the large manufacturing interests. They will advance the money. The sawmill people do it, and we are reaching nearly all the sawmills. We have a man who goes to the employer of labor and explains to him the benefit to him of the improved efficiency of labor, and he lends the man the money to go and get at least three or four treatments to stop the spread of the disease. It does not cure the disease, of course, as we try to explain to everybody, but it does stop its spread. The treatment we give is fourteen doses of arsphenamin and the mercury every other day. We do not dismiss them at all, but require them to come back for two or three years.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

ARTHROPLASTY*

By Frank D. Dickson, M.D.,
Kansas City, Mo.

The operation of arthroplasty has passed through the experimental stage and may be said to be a firmly established procedure. It should not be inferred, however, that it has reached the stage of perfection or even become classic. Today, after years of trial, there is still some divergence of opinion on many points of technic among those experienced in this work. Some of these are vital to success and should be settled and a uniform technic in the essential points should be established. Once a standard method of procedure is adopted, we may expect the personal equation of the operator to play a less important part and look for more uniform results in the hands of experienced operators. Such standardization can best be arrived at through the exchange of ideas and comparison of results among those who are doing arthroplasties. It is, then, with the hope of contributing something toward standardizing this operation that the results of our experience are submitted.

The cardinal points for consideration when an arthroplasty is contemplated are:

(1) The selection of cases suitable for operation.

(2) The method by which the joint can best be exposed.

(3) The amount of bone to be removed.

(4) The kind of material to be interposed between the bone ends.

(5) The after-treatment.

In the time at our disposal it is impossible to discuss each of these points in detail. Under each, we will merely endeavor to emphasize principles which have seemed important to us.

In selecting cases suitable for arthroplasty, too much care cannot be exercised. The selection should be based on general and local considerations. From the general viewpoint, only cases should be chosen which are in a position to go through with the entire procedure; that is, a serious operation and a trying and prolonged after-treatment. This rules out the old, the debilitated and those whose stamina, mental and physical, would make one doubtful as to their ability to bear the strain of operation and after-treatment. Economic conditions should also be taken into consideration. The prolonged conva-

Fig. 1.—X-ray of a joint with complete bony ankylosis. An arthroplasty should not be attempted on this joint.

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

lescence to which these cases must look forward often makes it unwise to attempt arthroplasty where the means do not permit of sufficient time being given for satisfactory after-treatment.

As local factors influencing selection, three contraindications to arthroplasty should be mentioned. These are: active disease in a joint, tuberculous disease in a joint, and solid bony ankylosis which has existed for years. It is evident that to operate on a joint in which disease is still active is but to court disaster. In tuberculous disease, ankylosis is the best protection against a relighting up of the process and it should not be broken up. If it is desirable to secure motion in such a joint, it would seem best where conditions permit to produce a pseudarthrosis in the neighborhood of the joint rather than disturb the ankylosis. Our experience in cases with complete bony ankylosis of years' standing, two attempts and two failures, leads us to believe that arthroplasty should not be done in these cases (Fig. 1). We have felt that the absolute disappearance of the capsular and ligamentous structures in such joints and the difficulty of building up muscular control of the joint after years of disuse might be two factors in the failure in such cases.

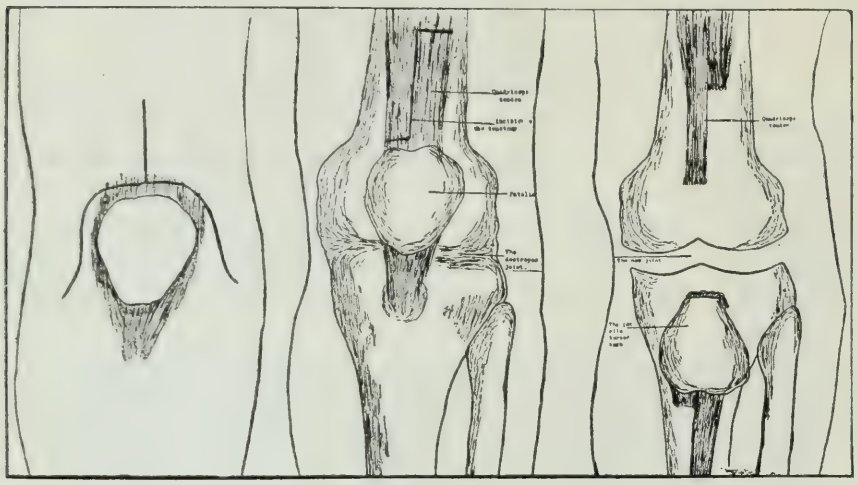

Fig. 2 Fig. 3 Fig. 4

Fig. 2.—Incision for an arthroplasty on the knee.
Fig. 3.—Showing incision of tendotomy on quadriceps.
Fig. 4.—Showing the joint after the arthroplasty.

In exposing the joint, an incision should be used which affords a free, unobstructed field for remodeling the bone surfaces and for placing the interposing flap. Small incisions are unsatisfactory and unnecessary. For the hip joint, the Smith-Peterson incision has been the most satisfactory. In the knee, an incision described by Putti, of Bologna, which is identical with that of Bennett for lengthening the quadriceps extensor tendon, gives a very good exposure and we are using it routinely. The incision (Fig. 2) is in the form of an inverted U, running around the upper margin of the patella from its center. A straight incision extends upward along the tendon of the quadriceps extensor muscle. To expose the joint, the quadriceps tendon is divided by a Z-shaped incision (Figure 3), the insertions of the vasti

Fig. 5.—A joint with fibrous and partial bony ankylosis upon which an arthroplasty should be attempted.

are cut and the patella turned down. In the elbow, the ankle and the jaw an incision which seems best to fit the case should be selected.

In removing bone, enough should be taken away to allow free, unobstructed motion. In the hip, a half or more of the head of the femur should be sacrificed. For the knee, we remove sufficient bone to leave at least a three-quarter inch space between the femur and tibia with the knee extended and ready for the placing of the flap (Fig. 4). A like interval is allowed in the ankle. When remodeling the bone ends, care should be exercised to preserve the capsule and ligaments as far as possible. Clean removal of bone, leaving no tags or fragments to form new bone, and careful smoothing of the fresh ends with a shoemaker's rasp or by other means, is important.

For the interposing flap we prefer a free transplant of fascia lata to Baer's chromicized pig's bladder or silver impregnated fascia of Allison and Brooks. Cargile membrane we have not used. In our cases there has been less reaction, local and general, with fascia lata and earlier movement has been possible. Pedunculated flaps we have not used for years.

Too much time and care cannot be given to the after-treatment of an arthroplasty. The result is largely dependent upon the faithfulness with which this is carried out. Two methods of after-treatment are available: one is immobilization in plaster for three or four weeks, followed by passive and active movements; the other is immobilization by traction and the early institution of motion. The latter has been the more satisfactory to us. Its advantages are: that motion may be started early, the bone surfaces are held from coming in contact, there is less pressure on the interposed flap, and contraction of the periarticular structures is prevented, a distinct advantage in securing a good range of motion.

Our routine is as follows: After arthroplasty in the hip the patient is placed on a Bradford frame and 15 or 20 pounds of traction are applied with the limb in full abduction. In the knee a short posterior plaster splint is put on with the knee in 20 degrees flexion and 5 to 10 pounds of traction used. In the ankle, a posterior plaster splint is applied and worn for five days, then a skate is fastened to the sole of the foot with liquid celluloid and traction used. In the jaw,

Fig. 6.—The same joint as Fig. 5, after an arthroplasty.

separation was maintained by using wooden wedges.

Passive motion is started by the sixth or seventh day. Active motion is encouraged as soon as the stitches are removed and insisted upon by the end of the second or beginning of the third week. In four weeks we have the patient up on crutches if the hip, knee or ankle has been operated upon. Traction of a few pounds is used at night and at intervals during the day for two months except in the ankle cases.

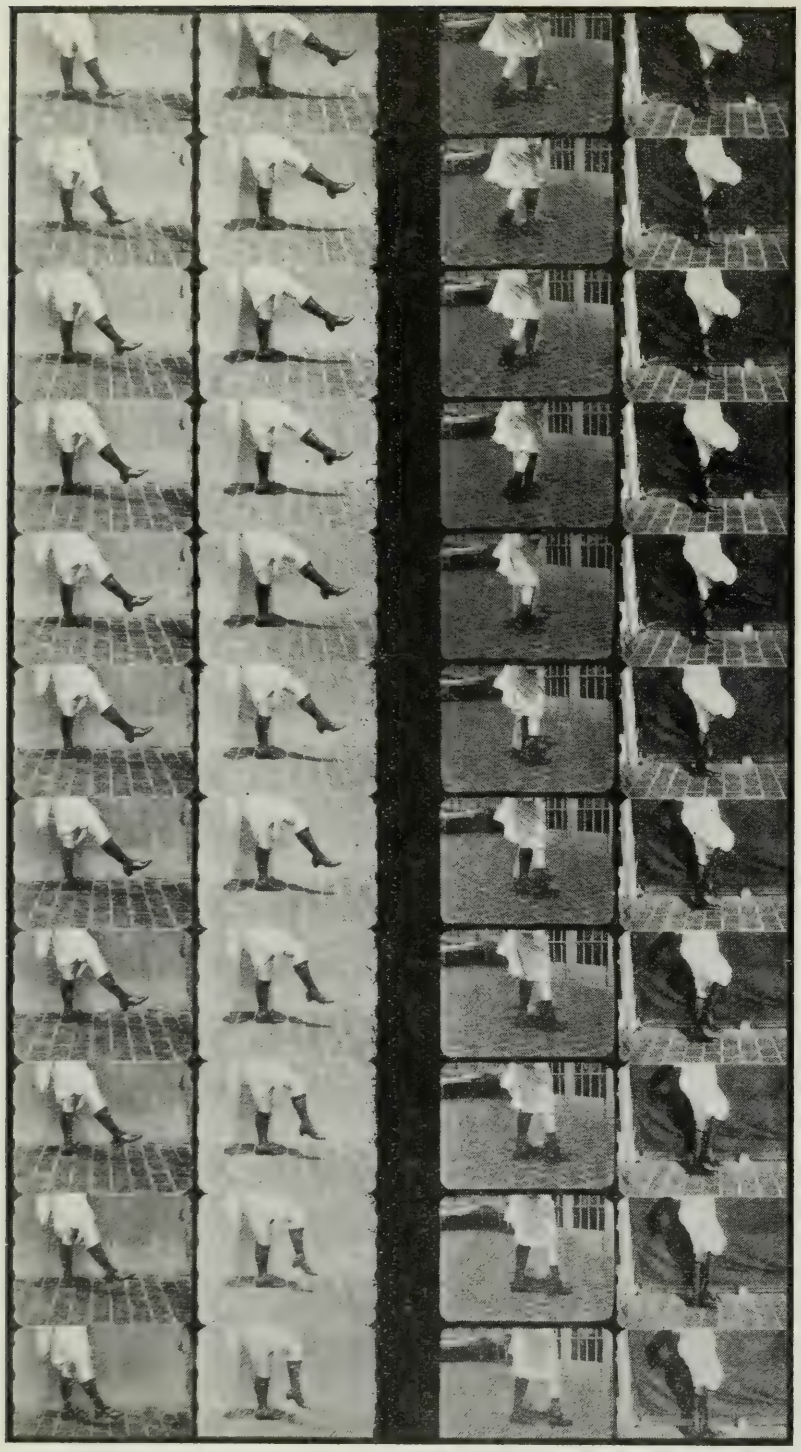

Fig. 7 Fig. 8

Fig. 7.—The amount of motion in the knee before and after operation.
Fig. 8.—Before and after arthroplasty on the hip joint.

Weight bearing is encouraged early and every effort is made to have the patient use the joint in as normal a manner as possible, as soon as possible (Figs. 8 and 9).

It should be stated that massage and muscle training are used daily from the time the stitches are out until the joint is being freely used. Careful muscle training after arthroplasty is, we believe, one of the vital factors in success. It is active movement of the joint which prevents reoccurrence of ankylosis and determines the usefulness of the joint. Passive motion can in no way take its place. The most painstaking care then must be used from the start to build up and re-educate the muscles controlling joint action. This is best done by a trained assistant, under the direct supervision of the operator. Unless this can be done it is advisable not to attempt the operation.

In arthroplasty of the knee or hip, one procedure was very helpful in getting movement. A frame was erected over the bed, to which was attached a pulley and a rope with a sling at the end. By placing the leg in this sling, which could be moved up and down along the limb, the patient was able to move and exercise the hip and knee at frequent intervals, helping himself by overcoming gravity through the sling and pulley.

To sum up, the following conclusions regarding arthroplasty are submitted:

(1) Cases should be carefully selected.

(2) An adequate incision should be used so that a good exposure may be secured.

(3) Sufficient bone should be removed to allow free motion.

(4) In the after-treatment the use of traction with early movement gives the most satisfactory results.

(5) The earlier the voluntary control of the joint is established the better the range of motion.

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DISCUSSION

Dr. G. E. Bennett, Baltimore, Md.—There are one or two things that either I misunderstood, or else I think Dr. Dickson is wrong in them. He stated that he did not think an old ankylosis should be operated upon. I believe he will agree

with me that, regardless of how old ankylosis of the jaw is, it should be operated upon, and I have found, in working in Baltimore for a good many years, that old ankylosis of the hip, of the non-tuberculous type, is one of the most satisfactory ankyloses to operate upon. But I do believe that there are certain types of joints, particularly the knee joint, in which a firm ankylosis of old standing should be left alone, unless the joint is in an unfavorable position. If you have an old ankylosis of the knee, in a very unfavorable position, you are justified in doing an arthroplasty, because if the operation is a failure as an arthroplasty, it will be successful in correcting the deformity. I believe that the arthroplasties, in which Dr. Dickson has shown such splendid results, are due to his excellent judgment in selecting his cases.

If you look back over ten or twelve years, I cannot help feeling that the successful knees are the ones which did not have a firm, hard ankylosis.

As to the type of material, we have had experience with only one type of material. Dr. Baer wanted to stick to the membrane and see it through. He felt that it had to be proven or disproven where its use was, and that it rested in his hands to do it. Therefore, personally I have had no experience with fascia.

Dr. Willis Campbell, Memphis, Tenn.—I have found the contra-indication not only in the types of cases mentioned by Dr. Dickson, but in those cases in which there has been extensive osteomyelitis, and in which the bone is hard, dense and eburnated on both sides of the joint for a considerable distance. I have done five or six knees of that type, and all were failures. It is absolutely essential that we shall have as a basis for the formation of the joint healthy, spongy bone.

As to the length of time, I have been guided a good deal by the x-ray pictures.

Those cases in which the medullary canal has extended absolutely through the joint, I think, are quite unsuited for operation.

As to the amount of bone to be removed, it depends a good deal upon conditions. It is acquired by experience alone. In individuals with considerable musculature, and where the condition has not existed for a very long time, say the knee, for instance, we can remove more bone than in other cases. Then the position of the joint must be taken into consideration. If the knee is considerably flexed or distorted, more bone must be removed than in those cases that have been kept perfectly straight.

Another factor in a joint that is flexed is that it is not always necessary to lengthen the quadriceps tendon. When the joint is extended we have plenty of play in the quadriceps muscle. Of course, these are points which Dr. Dickson undoubtedly understands, but I am bringing them out in the discussion.

Now, as to the substances interposed, I do not think that makes so much difference. It is not essential or necessary, and I think we might say it sometimes complicates matters, to try to reproduce a joint in detail. For instance, why make a spine and an intercondylar notch in the knee when there are no ligaments to be considered? I make one condyle on the knee, and then make a corresponding depression on the tibia. In the elbow the same proposition comes up. I make one broad surface, and that is quite sufficient. I took three knees recently, and put nothing in at all. That was about a year ago. Two were failures, and one was very successful. I believe the fascia lata is by far the best material for transplanting between the joint surfaces. I generally use a large double layer over each surface, but that is a question depending upon the individual.

In children I have done several of these cases. Two of them were of the dense osteomyelitic type of bone, and both were failures, due to the character of the bone in those individual cases, and not to the fact that they were children. Both recurred. I have one successful case in a boy about 10 years old. Of course, we must be very careful not to interfere with the epiphysis. This boy now has about forty degrees motion.

We have done about forty knees in all. My first series I reported two years ago at the American Orthopedic Association. During the last year the results have been eminently satisfactory. I do not think we have had a definite failure. Two years ago, in Louisville, I reported one case in which we had transferred the prepatellar bursa between the patella and the femur. We had a very successful result in that case. We get that type of case sometimes, a very good joint, but complete bony ankylosis between the patella and the femur.

The after treatment, of course, has been described by Dr. Dickson very carefully. I feel that passive motion depends upon the condition of the case in question and upon the healing. I do not believe in beginning active or passive motion in a joint in which so much surgery has been done until the parts are healed. Some of them heal up in ten days, and some take three weeks. About one year ago I did an arthroplasty in a young lady who was rather frail. It was practically impossible to begin passive motion for six weeks, on account of the slow healing of the parts. Finally we did begin, and under gas manipulated the joint very gently. We were able to secure about twenty degrees motion. The young lady did not do well under treatment, because her physical condition was not good, so I told her to go home, take a rest and come back. I gave her certain apparatus to use, and told her to walk on it as much as possible. She came back about two days ago, and she now has about ninety degrees motion. I have had other cases which did just as well without physiotherapy.

Dr. Dickson (closing).—I should have liked to elaborate several points in my paper, but was asked to make it short. Had I elaborated the particular point which Dr. Bennett brought up, I would have said something about bony ankylosis in the elbow and jaw, as contrasted with the knee and hip. Dr. Baer and Dr. Bennett may get results in cases in which there has been prolonged ankylosis, with extreme proliferation and eburnation, but I do not feel that I am capable of getting motion in these joints. A wedge-shaped resection is much better for me to do in these cases, as it gives the patient relief.

Dr. Campbell's work, of course, is so well known that anything he says has to be given a great deal of consideration. I want to say as much as this about the control of the joints. I think we

can all think of cases in which we did something which we do not ordinarily do, and in which we obtained good results. But I tried in this paper to outline a systematic procedure for arthroplasty. It is up to any man who has done many to try to work out the factors which influenced it successfully or unsuccessfully, so that we may get a standard technic. There was slow healing in one of these cases, and she moved the knee herself long before the incision had healed, and while there was some discharge. We all know that there is a time in arthroplasty, probably at the end of six weeks or two months, when we have scarcely any motion, but later we may be surprised at the motion which comes. I have one such case. He was a high-strung young fellow, and I knew that I was up against a proposition, but finally went ahead and did it. For one year he worried the life out of me. He had very little motion, and said what he had was worse than before. But I saw him recently, and he has splendid motion. He was worked over most thoroughly. His people could well afford any form of treatment, and practically kept a masseur and physiotherapist employed. After he threw all that away and went out on a farm he improved more rapidly.

I do believe that early voluntary control is an important factor. At least, it is of enough importance to make us think about it and try the early institution of motion and, above all, the institution of early voluntary control.

The remodeling that you spoke of, Dr. Campbell, I suppose is a survival of my old teaching. Dr. G. G. Davis was always very particular about giving some sort of a spine and some sort of a notch. It may give some little lateral stability, but I think lateral instability is a bugbear which has been very much exaggerated.

SO-CALLED PERTHES' DISEASE*

By F. Walter Carruthers, M.D.,
Chief of Department Bone and Joint Surgery, Baptist Hospital; Chief Surgeon, Arkansas Home for Crippled Children,
Little Rock, Ark.

After reviewing this subject in the current literature, I feel that its real title should be "The Disease of Many Names," better known to some of you as Leggs' disease, pseudo-coxalgia, osteo-chondritis deformans, and juvenile deforming osteochondritis.

Perthes' disease is one applied to a class of cases formerly mistaken for mild forms of "hip disease."

It was, I think, first described by A. T. Legg in 1909 as an obscure affection of the hip joint; by Calve, in 1910, under the name of pseudo-coxalgia, and in a more detailed manner by Perthes in that same year, or thereabout.

If a personal name should be given it, no doubt it should be called "Legg-Perthes' disease." H. L. Taylor, in some of his recent publications, has designated the condition as "quiet hip disease."

The etiology of it is not obscure, for a definite history of trauma of great or less severity is given. However, this question of trauma as a factor has been disputed and proven not to exist by Allison, of St. Louis, who tried it out in a large number of cases experimentally with dogs. It is seen most often in the male, during the ages from seven to adult. It is almost invariably unilateral, making its appearance in apparently healthy individuals free from all history and findings of tuberculosis, syphilis, rickets, scurvy, and infections.

It is not necessary to dwell upon the question of pathology, as there has never been any definite conclusion as to the real pathology.

The x-ray findings are most important. Let us roughly consider the x-ray findings of bone and joints in children and see just what we have to contend with in a differential diagnosis of this condition. In the study of those conditions from birth to the third or fourth year, we might say, first, we have tuberculosis from birth to one year very, very infrequently. This same rule, I believe you will agree with me, applies to epiphysitis. The conditions seen at this period of life are scurvy, rickets and syphilis, and uncommonly the ordinary arthritis.

Stepping further up the ladder of age, from the third to the seventh year, you will encounter the same conditions with the addition of tuberculous affections. From the seventh year to adulthood it is practically the same with the addition of Perthes' disease. What I have outlined is not absolute, of course.

In the x-ray appearance of rickets you have multiple joints involved, peri-articular swelling and marked disturbance of epiphyseal line with an inverted saucer-

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

shaped appearance. The epiphysis proper is not disturbed, but the epiphyseal line shows the change. And with this are extreme atrophy and marked periostitis.

In syphilis, you have multiple involvement, peri-articular swelling and fluid at times. The cartilaginous surface is intact, and as in rickets there is a marked disturbance of the epiphyseal line. However, there is no softening or saucer-shaped depression. There is a localized area of softening beneath the periosteum where the cartilage of the joint begins. It looks as if it might have been bitten out, starting first at the epiphyseal line extending down into the bone proper. The line proper is undisturbed, atrophy is generally absent, while on the other hand a bone production is seen with periostitis always present.

Scurvy occurs in the very young. The joint is intact and the epiphysis and epiphyseal line are undisturbed. However, there is a formation of a destructive line about one-sixteenth of an inch below the epiphyseal line, periostitis is always present, and at times a hemorrhagic area will be seen which might be mistaken for sarcoma after the severe pain stage has passed.

This brings us now to the tuberculous and non-tuberculous affections, which are no doubt the "stumbling-blocks" as far as a real differential diagnosis is concerned. Tuberculosis is usually seen about the third or fourth year and sometimes later, but as a rule only one joint is involved with very marked peri-articular swelling on account of which in the early stages the joint is very indistinct. As the disease progresses the articular surfaces become irregular and worm eaten, and the cartilage and surrounding bone are slowly destroyed with marked atrophy.

Acute epiphysitis is almost impossible to differentiate from tuberculosis except that as a rule the joint does not become so hazy and the destruction is more rapid. As the disease subsides there is bony ankylosis, while in tuberculosis as a rule there is cartilage.

Perthes' disease is, as stated, seen around the sixth or seventh year and as a rule is limited to one joint, though it may involve both. In this connection let me impress the importance of an x-ray examination of both hips. In many of the so-called doubtful cases it is necessary to have an x-ray of many of the joints before coming to a final conclusion, but more especially bear in mind the importance of a comparison of the opposite hip. I have seen this point overlooked in many a well-regulated clinic. With all signs pointing to tuberculosis, there is no hazy or cloudy appearance to the joint. The epiphysis looks crushed and flattened, with marked eburnation of bone beneath the cartilage. The condition is confined absolutely to the head of the femur and the acetabular surface is never involved. In a well defined case I judge there is no condition which gives such a distressing looking x-ray picture with no more real pathology involved in the entire clinical field of medicine and surgery. Therefore the characteristic feature of the disease is the astounding x-ray picture associated with little or no disability.

According to Albee, "On account of the marked atrophy, shortening of the head takes place and during recovery from this pathological standpoint calcium salts are again deposited in the head, which becomes flattened out against the acetabulum as the 'mushroom' type of head, while the neck is thick and short."

The clinical picture is one of a child usually between the ages of six and eight or older who comes to you with a history of a fall four or six months previously, limping at the time. He complains of one leg which tires easily and a slight deformity at the hip, and is unable to bring the leg inward without some pain which, especially on marked abduction, is severe. Flexion and extension are apparently normal, and possibly there is a little shortening of the limb. Bryant's triangle will show no doubt a shortened base line; furthermore, the condition is unilateral. The question of diagnosis has already been considered.

Treatment should consist in relief of weight bearing, whether it be by rest in bed or some appliance, regardless of the fact that this condition is considered a self-limiting disease of two or three years.

DISCUSSION

Dr. E. G. Brackett, Boston, Mass.—There is also a Norwegian whose name has been given to this disease, who wrote early and voluminously upon it. It is a disease of many causes. It has been suggested in the last few years that it might sometimes be due to osteomyelitis, and occasionally there has been shown by x-ray a local osteomyelitis in the neck which has seemed to interfere with the nutrition of the epiphysis. I have seen one of this type in the last year, in which the findings were first in the neck, then appeared in the head, and followed the typical course of Perthes' disease. Apparently this inflammation, which was distinctly localized in the neck and which resulted in a definite amount of destruction, was near enough to interfere with the nutrition of the epiphysis.

You are probably all familiar with the work of Dr. Z. B. Adams with the old congenital hips, in which more or less has been done by forcible manipulation, and in which almost invariably deformation of the head has occurred. He was able to demonstrate cases which he found in France, done by Denuce's method, in which there was no violence used, which show practically no deformation of the head. We can always feel that there is an injury of the epiphysis, which may come from quite a number of sources.

Dr. Frank D. Dickson, Kansas City, Mo.—I have been rather impressed in the past year by the fact that in three cases of this condition I have had associated chorea. Two of the cases were accompanied by such severe chorea that they were under medical treatment for many weeks. In the other case the symptoms were quite mild, but sufficiently marked to be diagnosed chorea by an internist who did not know anything about the other condition. I always feel that there is a connection in some way between the endocrine system and this condition.

Dr. W. B. Carroll, Dallas, Tex.—I have examined a number of these patients after the deformity has occurred and they have complained only of limited abduction and some aching in the hip after excessive use. None of them had ever had any treatment, but gave a history of a fair amount of discomfort over a period of several months, several years previously.

I am treating one case in a boy thirteen who has thickening in the neck, slight flattening of the head and an area of rarefaction in the diaphysis adjacent to the epiphyseal line. He has had mild symptoms for the past four months. He is wearing a short plaster spica and using crutches. I expect to have him continue this for some eight or ten months. Whether it is necessary I am not sure, but hope to have less deformity than if weight bearing were permitted. I have seen two patients who were rather unusual in that the history indicated beginning of symptoms, one at seventeen and one at nineteen. In neither was there any previous injury, but gradual and moderate incapacity for full use of the hip, which lasted from one to two years. When I examined them three or four years later their only disability was limited abduction. No treatment had been followed. These were unusual in that symptoms started at this advanced age.

Dr. E. Laurence Scott, Birmingham, Ala.—I should like to ask Dr. Carruthers what decides him when to stop treatment. He said it was limited to two or three years. I wonder if he has any scale he goes on, length of time, radiographic finding, etc., to stop treatment.

Dr. Carruthers (closing).—I think that that depends upon physical findings in the case. I mentioned the fact that it is two to three years simply because it is generally looked upon as a self-limiting disease, of two to three years, whether or not anything is done. I think you can probably help the condition along by following some procedure of avoidance of weight bearing in these cases.

TWO CASES OF GAS BACILLUS INFECTION WITH RECOVERY*

By Hugh N. Page, M.D.,
Augusta, Ga.

In looking up the literature of gas bacillus infection it was very surprising to find that little, if anything, had been written upon this subject since the close of the war. This is due no doubt to two factors, one the rarity of the infection in civil surgery and the other the success of the dictum evolved during the war for the treatment of these cases, namely: "Cut until the muscle jumps and leave the wound open." Unfortunately this method of treatment, while satisfactory as to results, is impracticable in civil surgery on account, principally, of the long period of treatment necessary.

In the "Index of Prognosis" (Short), the mortality of gas bacillus infection in the acute stage, even under war treatment, was: for the thigh, approximately 50 per cent; and for the leg, approximately 33 per cent. Of course the mortality under less radical treatment is much higher. However, when this type of infection is diagnosed, the earlier and more radical the treatment the lower the mortality.

The two cases here reported illustrate the acute fulminating and the latent fulminating types of the infection and an

*Read before the meeting of the Railway Surgeons' Association of Georgia, Atlanta, Ga., August 15, 1923.

endeavor will be made to bring out some suggestions for handling these cases.

Case I.—U. H. No. 29693, J. C., negro, male, age 9 years, was admitted March 29, 1923, with traumatic amputation of the right leg just below the knee. He had been run over by a railroad train. The leg was attached only by a small strip of skin. Much dirt and many cinders were ground into the wound. A strip of soft tissue was stripped up from the popliteal space. There was also traumatic amputation of the middle and ring fingers of the right hand.

The leg was removed and preliminary cleansing and dressings were applied in emergency ward. On inspection of the injury it was decided to amputate at the junction of the middle and lower thirds of the thigh. A long anterior flap amputation was done under ether anesthesia, with the patient in moderate shock. The muscle and fascia seemed in excellent condition at the level of amputation. The wound was closed with one through-and-through tissue drain at the flap angles. The middle and ring fingers were amputated. Seven hundred cubic centimeters of normal saline were given by hypodermoclysis. The patient left the table in fair condition and there was normal reaction from the anesthesia. Late in the afternoon of the day following the operation the patient began to talk irrationally. His temperature was 99 degrees and his pulse was 130. At 11:00 p. m. the temperature jumped to 104.2° and the pulse to 150. The wound was dressed and there were no signs of infection, and there was no crepitus. Three hundred cubic centimeters of normal saline were given by hypodermoclysis. The next morning, March 31, when seen, his temperature was 103 degrees, his pulse 142, and his respiration, 26. Leucocyte count was 12,500. There was marked subcutaneous crepitus from the thigh to the gluteal fold behind and to about a hand's breadth above Poupart's ligament on the abdomen in front. There were numerous blebs on the thigh. The characteristic odor of gas bacillus infection was present.

The wound was immediately opened by wide removal of all sutures and five Carrel tubes were inserted into the muscle sheaths affected. The wound was packed with gauze and Dakin solution was injected through the tubes every two hours. Soda bicarbonate one dram four times a day was given to combat the theory of the acid toxemia of gas bacillus infection. The temperature immediately fell and at 8:00 p. m. it was normal. For the next two days there was an afternoon rise to 102 degrees. The culture from the wound showed the Bacillus Aerogenes Capsulatus. At the end of eleven days the temperature became normal, but there was still some sloughing of the affected muscles; and cultures continued to show active infection. No sterile culture could be obtained for about four weeks after infection; and after three successive sterile cultures on May 1 it was decided to re-suture the wound. As so much of the flaps had become necrotic, it was necessary to remove a portion of the femur. On attempting to obtain healthy bone for the stump, it was found that the whole femur was dead up to the greater trochanter. The hip was disarticulated. The patient had an uninterrupted recovery. When last seen, about one week ago, the stump was healed and in excellent condition.

Case II.—U. H. No. 30111. J. D., negro, male, age 28 years, was admitted May 4, 1923. Diagnosis was lacerated wound of the left foot caused by being mashed between two railroad cars. There was a compound comminuted fracture of all metatarsal bones. Flap of skin was stripped up consisting of the entire sole of the foot. Debridement was done and Carrel tubes were inserted and the case was treated with Dakin's solution in an attempt to save the foot. The case was first seen by me on May 10, 1923, six days after the injury. The foot then was gangrenous to the ankle. There were no signs of gas infection. Amputation was decided upon and the middle third of the leg was chosen as furnishing the most serviceable stump. The temperature varied during that time from normal to 101 degrees. His general condition was good. The white blood count was 13,000. On May 12 amputation was performed at the middle third of the leg, using a long posterior flap. The wound was sutured with interrupted sutures. One tissue drain was placed through the stump and out at the angles. At the time of operation one of the assistants remarked that the muscles were dark in color, but no particular attention was paid to that. Culture was made. On the evening of May 13, the day after the operation, the temperature rose to 106 degrees and the pulse to 160. The culture was positive for gas bacillus. Immediately, even though no signs of crepitus or other gas bacillus symptoms were present except high temperature and great depression, the wound was opened wide by removal of all sutures, Carrel tubes were inserted and irrigating with Dakin's solution every two hours was begun. One dram of soda bicarbonate four times a day was employed for the same reason as in the former case. The temperature gradually receded to normal within ten days. Culture from the wound continued positive. On June 15, about one month after the operation, in view of continued positive cultures from the wound, it was decided to change treatment. I should say here that at each dressing the wound was irrigated with hydrogen peroxid and potassium permanganate alternately in an effort to furnish oxygen to combat the anaerobic organism. Following Blake's suggestion that alkaline dressings were best in these cases, sufficient bicarbonate of soda was added to 1 per cent solution of boric acid to make a solution alkaline to litmus. The stump was put in a continuous bath of this solution. In one week a marked improvement in the appearance of the stump had taken place. It appeared more healthy in ten days. On June 25 three negative cultures had been made. On June 28 about three inches of the tibia were removed and the head of the fibula was disarticulated in order to close the stump in the upper third of the leg. Recovery was uninterrupted.

In the first case the very grave error was made of not obtaining a culture at the time of operation. This would have enabled us to open the wound with assurance at least twenty-four hours before this was done. Early and wide opening of the wound in these cases is the deciding factor between success and failure. In the second case, there was no hesitancy in immediately opening the wound on account of the information given by the positive culture.

In both cases the onset of the diagnostic symptoms was very sudden: in the first, forty-eight hours after injury; and in the second, eight days after the original injury and twenty-four hours after the secondary operation. This directs attention to the opening up of new passageways for the spread of infection by operative measures, though this applies more to the second than to the first case, as in the first there had been no time for barriers to form. In both cases the amputation was well above the site of injury, though it must be admitted that in the second case attention was called to the dark color of the muscle, even though the amputation was twelve inches above the line of demarkation at the ankle joint.

In view of the scarcity of these cases it is almost impossible to draw conclusions as to treatment. Both these cases, under standard Dakin treatment, were extremely long drawn out as regards extermination of the infection. The second case seemed to improve rapidly when changed to alkaline treatment, although at the late date it was instituted it may well be that the infection was on the wane and would have cleared up just as rapidly under a continuation of the Dakin solution. If more cases are obtained the alkaline method seems worthy of trial. One fact should be noted, namely, that in the second case there was practically no necrosis of the bone such as occurred in the first case.

RUPTURE OF SPLEEN, AUTOTRANSFUSION AND RECOVERY*†

By Fred C. Watson, A.B., M.D.,
Assistant in Surgery, University of Tennessee,
Memphis, Tenn.

Marcelino Montenegro (History No. 2522), yellow, male, Columbian, age 40 years, occupation laborer, was admitted to the hospital at 1 p. m. February 27, 1921. At about 10 o'clock the night before, as he was walking along the railroad tracks, he was struck on the lower left side of his back by a pump car. Considerable pain in the left side of the abdomen was experienced at the time and he was carried to his quarters. The abdominal pain steadily increased in intensity. There was nausea and vomiting, together with progressive weakness, restlessness and thirst.

On examination there were superficial abrasions and contusions over the left lower posterior thoracic and lumbar regions and a superficial abrasion of the tip of the nose. The skin and mucous membranes were pale and anemic in appearance. The respirations were rapid and shallow. The pulse was 120 and of poor volume. The temperature was subnormal. Abdominal examination showed general tenderness and rigidity, both of which were most marked over the left side. The spleen was enormously enlarged, reaching the crest of the ilium below and one inch to the right of the midline of the abdomen. There was dullness in both flanks. The liver could not be felt. The lungs were negative. The heart sounds were rapid and weak. The systolic pressure was 75. A blood examination showed a white cell count of 15,200 with 79 per cent polymorphonuclears. The hemoglobin estimation (Talquist) was 40 per cent. A catheterized specimen of urine was negative for blood. No blood had been passed per rectum.

The patient was given 1000 c. c. of normal salt solution intravenously; strychnin sulphate gr. 1/30; morphin sulphate gr. ¼; atropin sulphate gr. 1/150, and was shaved for immediate operation, a diagnosis of rupture of the spleen having been made.

Under ether anesthesia a long left rectus incision was made. On opening the peritoneal cavity it was found to be filled with blood. There was clotted blood in the region of the spleen. A superficial transverse laceration was seen on the external surface of the spleen, near the lower pole, while a deep laceration could be felt on the under surface near the hilum. Eight hundred cubic centimeters of blood were removed with a small porcelain dish and poured into a glass receptacle containing 100 c. c. of a 2 per cent

*From the Medical Department of the United Fruit Company, Panama Division.

†Read before Henderson County Medical Society, Hinson Springs, Tenn., June 18, 1923.

solution of sodium citrate. It was then filtered through several layers of gauze into a Kelly infusion bottle and was injected into one of the veins at the bend of the right elbow.

While this part of the operation was being performed by my associate, Dr. P. H. Desnoes, an incision was made along the left costal margin, joining the upper end of the initial incision, to afford more room for the removal of the enormously enlarged spleen. The omentum, which was densely adherent to a large calcified area on the external surface of the spleen, was divided between clamps, the spleen dislodged and its pedicle ligated and cut. As there was slight oozing from the splenic bed, a gauze pack was introduced and brought out through a stab wound in the left flank. The abdominal incision was closed in the usual manner. The spleen when removed weighed 6½ pounds and measured 11½ by 7 by 3¾ inches. It contained much dark clotted blood and there was a thick calcified area four inches long and two inches wide near the center of the external surface to which the omentum had been attached.

Post-Operative Course.—The patient was considerably shocked as the result of the operation and the loss of blood, but soon reacted, after which convalescence was uneventful. The gauze packing was removed on the fifth day. The stitches were removed on the sixteenth day. The incision healed by first intention. He was discharged from the hospital April 2, 1921, thirty-four days after the operation. When seen two weeks later he felt well and strong and was able to do light work.

By autotransfusion is meant the introduction into the patient's circulation of his own blood lost by internal hemorrhage. This method of treating severe cases of internal hemorrhage was originated in 1914 by Thies,[1] a German gynecologist, who used it successfully in three cases of ruptured extrauterine pregnancy. It has been used most extensively in Germany and in other parts of Europe. While it has not been used so widely in America, several American surgeons have reported one or more cases. The literature contains references to more than 164 cases. Burch,[2] in a recent report on this subject, has carefully reviewed the literature and to his article the interested reader is referred.

Ruptured extrauterine pregnancy has been the most frequent condition in which autotransfusion has been used. It has also been used in rupture of the liver, rupture of the spleen, gunshot wounds of the spleen, and of the lung, post-partum hemorrhage, placenta previa and rupture of the uterus. In the three last mentioned conditions, however, it should not be used intravenously on account of probable contamination of the blood. In these cases it may be given intramuscularly or as a rectal injection. It is also contraindicated in those cases of internal hemorrhage complicated by rupture of the stomach or intestine.

It is not recommended that autotransfusion be resorted to in every case of internal hemorrhage, for frequently the hemorrhage is not alarming and time may be had for the proper selection of donors. This is preferable and should be done when possible. It is in those cases of active hemorrhage into the abdomen of such gravity as to jeopardize the life of the patient in which delay in the selection of a donor would be fatal that autotransfusion is frequently a life-saving procedure. Originally the blood was mixed with normal saline solution. In an extreme case, however, Burch states that the pure blood may be reinjected. On account of the danger of coagulation of the blood, the best plan probably is to mix it with sodium citrate solution (2 per cent) in the proportion of 450 c. c. of blood to 50 c. c. of the solution. The technic of its administration is that of an ordinary saline infusion.

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MISTREATMENT OF A TWO MONTHS OVERDUE PREGNANCY*

By George F. Pendleton, M.D.,
Kansas City, Mo.

At 5:30 p. m., June 11, 1921, I left a good dinner to respond to an S. O. S., and the following is what I found:

Mrs. D. H. A., age 39, a husky farm wife, married 19 years, had had eight full-term children delivered on time, a miscarriage of triplets and a miscarriage of twins. She was badly torn with her first baby and never repaired. During her spare time she managed her ten-acre fruit farm. Twelve years before she had had uremia and edema with coma. She was in bed five weeks and not pregnant at that time. Three years before she had had a slight attack of influenza

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twice. With these exceptions she had never been sick.

Her last menstruation was June 28, 1920. She had forgotten when she felt life, but since July 30, 1920, she had been nauseated and had vomited frequently. She was at the time more than two months overdue, and came to Kansas City June 2, 1921, for advice. Her doctor sent her to the hospital, where she remained with a slight cold for five days. At times her chart read T. 101.8; P. 108 to 116; R. 22. Her urine was negative for albumin, sugar, casts and blood cells.

June 9, 1921, she awakened with slight labor pains, which continued through that day and the following night. June 10, 1921, at 9:30 a. m. she was taken to the delivery room with pains, twenty minutes apart, and given 1 c. c. of pituitrin hypodermically. She responded with "one heavy, bad pain."

At 10 a. m. she was vomiting green fluid, pulse 136.

At 10:15 a. m. there was a consultation with Dr. B., who diagnosed "cervical cancer" and advised allowing her to go through normal labor.

At 10:30 Dr. A. disregarded the consultation and tried to introduce a Voorhees bag, without success.

At 10:35 she had a hypodermic of pituitrin, 0.5 c. c., and one moderate contraction resulted.

At 11:40 she had 0.5 c. c. pituitrin, and there was no change.

At 1 p. m. her pulse was 124; respiration 36; and she was nauseated.

At 2:35 a Voorhees bag was inserted, but the bag leaked.

At 2:40 she had 0.5 c.c. pituitrin, and a bloody vaginal discharge without "pains."

At 3 p. m. digital dilatation was tried. There was more bloody discharge, and she vomited much green fluid.

At 3:20 she had 0.5 c. c. pituitrin, and there was no change.

At 3:55 she had 0.5 c. c. pituitrin, with no change.

At 4:10 he catheterized 4 ounces and tried high forceps, but could not get results, so he called me.

I found a well-nourished young lady, red-cheeked, of keen mind, looking younger than 39 years. She had never had an abnormal bloody discharge or noticed any loss of weight. Her heart was not remarkable, but crepitant rales were heard at both bases of the lungs posteriorly. Her temperature was 100; pulse 101; respiration 24. The fundus was stony hard and very tender. The abdomen was symmetrical, but no external palpation could be made. A heavy pulsation all over the fundus was synchronous with her carotid pulse. No fetal heart was heard. The McDonald measurement was 32.5 cm., and modified Ahlfeld was 28 cm. Vaginally, the cervix and upper vagina were a mass of rough, uneven, small hunks of flesh, but evidently fully dilated. Breast and arms presented with the fetal head somewhere on the right ilium, with two polyp-like masses hanging down posterior to the fetus to within three inches of the vulva.

Under ether at 6:20 p. m. she was prepared for a version. I pulled down the polyp-like masses and found each was a loop of the small intestine; explored the uterus posterior to the fetus and found a direct split from the cervix upward directly in the posterior line to about six inches of the top of the fundus. Pressure in the apex of the tear caused more tearing upward; pushed the gut back into the abdomen, felt the right and left ovary, palpated the right and left uterine artery from within the abdomen and found no bad bleeding as from a ruptured artery. Under deeper ether I slowly pushed the breast upward and allowed the head to enter the pelvis. Trying to rotate the head from ROP to ROA, without success I applied the forceps and delivered the head as a persistent ROP. I carefully delivered the placenta manually from the anterior portion of the fundus. The placenta was not remarkable, but the cord was almost detached at its placental junction. I investigated both uterine arteries again per vaginam and the uterine rupture without discovering signs of arterial hemorrhage.

I sewed the posterior rent as if doing a vaginal cesarean on the posterior surface, using a No. 2 chromic continuous suture, working from the cervix upward. The tear went upward and slightly to the right. Closed without drainage.

At the cervix I found the vaginal walls torn from the cervix except directly under the bladder, which accounted for the diagnosis of carcinoma. I restitched the vaginal walls to the cervical sides with No. 2 chromic interrupted sutures. Posteriorly I pushed the rectum back through the posterior tear, and sewed the rectal fascia and vaginal mucous membranes. I finished at 7 p. m. The mother was awake at 7:45 p. m., but had no complaint of pain.

The baby was a boy, very large and somewhat macerated. It took one breath only, then died. The cord was 20 cm. long. The baby was 65 cm. long, OM diameter 15.5 cm.; OF, 14; SOB 11; BiP 11; frontal 8. He was well formed and weighed 12 pounds 6 ounces.

In August, 1922, her doctor informed me that she was in very good health.

I cite this case to show the following things:

(1) A ruptured uterus with a living patient.
(2) The dangerous use of pituitrin.
(3) A baby two months post-matured.
(4) Misuse of the Voorhees bag.
(5) Mistaken diagnosis of cancer of the cervix.
(6) Indiscriminate use of the high forceps.

DISCUSSION

Dr. George C. Mosher, Kansas City, Mo.—Knowing something of the history of this case, I rise to say that the gentlemen who were origi-

nally in charge of it were not obstetricians. One is a railroad surgeon, and the other was a general practitioner. It is certainly an indictment for the indiscriminate use of pituitrin. I think the ruptured uterus occurred with the first "shot" of the pituitrin, and if the history of this case were disseminated throughout the country it would do something to counterbalance the propaganda which the agents of the pharmaceutical chemists are using in inducing the profession generally that pituitrin is harmless and can be used indiscriminately. This is an object lesson to take home, that pituitrin has its purpose, but it is like other agents for good, the use of the remedy when it is not indicated is very harmful.

Dr. H. A. Davidson, Louisville, Ky.—I should like to ask the Doctor why he decided to close the uterus and not open up the abdomen. Also why he did not put any drainage in the cul de sac?

Dr. W. G. Bogart, Chattanooga, Tenn.—This is an object lesson not to let the pharmaceutical men push things on us.

Dr. W. P. Patterson, Springfield, Mo.—Pituitrin is a good agent under certain conditions, but there is only one time when it is proper to use it, and that is in uterine inertia when the gateway is open. In the hands of ignorant men it is capable of great harm, as was shown by Dr. Pendleton. I think the rupture of the uterus, as Dr. Mosher has said, was due to the first c. c. of pituitrin.

Dr. James R. Garber, Birmingham, Ala.—I would like to ask which one of these physicians recommended the use of pituitrin. If I were betting I would say it was the surgeon.

Dr. Pendleton (closing).—I think Dr. Davidson hit the weak point of this whole case, a closure without drainage. That is very risky, especially in a patient already running a temperature, with rales at the base of the lungs. However, "If you are in doubt, do not drain." Naturally, in a case like that one is nervous, and I spent most of the time going through the posterior rent, feeling the ovaries and palpating the arteries, from which there was absolutely no hemorrhage. I happened to know the man who had had the case, and he is a clean man. He makes vaginal examinations with a glove and is very strict about how the patient is prepared. The real reason I closed the uterus without drainage was the advice, "when in doubt do not drain." There was one other reason. When I brought the two edges of the cervix together I started to repair with a No. 2 chromic gut. I let that hang clear out of the vagina, so if I wanted a drain later I had a guide to the right spot.

As it happens, this man is not a surgeon, his consultant is one. I do not know why normal labor should go on when there is cancer of the cervix. You had better do a cesarean and not do any damage at all. You know if you do a hysterectomy with cancer of the cervix and do not get it all, it grows like wildfire.

A PORRO-CESAREAN SECTION*

By E. T. Newsom, M.D.,
Sheffield, Ala.

A woman, aged 22, small in stature, was seen by me in consultation with a man who does nothing but pediatrics. He was called in to see her on account of her rapid breathing and rapid pulse. He was very mysterious about the case. He had not so much to say as usual. He said he would let me look and then talk to me later. He went in and threw the coverlet back from this woman.

She was a regular mountain, starting at the symphysis and going up perpendicularly, with a flat table at the top and then dropping downward to the sternum. On palpating the abdomen I felt three huge fibroids there. On working the right hand between the two largest and putting the other hand on the abdomen the fetal movement could be registered. The doctor said it was a large fibroid. I said, "Yes, and also a baby." The only thing we could get out of the girl in the way of history that would help us in the diagnosis of pregnancy was the fact that ten months before was the last time she had menstruated. Her pulse was 130 and respiration was very rapid. Her bowels had not moved for a week. She had not retained any nourishment for three days and had vomited most of the water she drank. Her mother and father were called in and we had a talk with them and told them that the girl, in addition to these tumors which had been growing for a long time, was also pregnant and was near the end of the tenth month. They asked what should be done. I said the only thing I knew to do would be a porro-cesarean section. They sent her to the hospital. We tried several enemas to get the bowels to move, but did not succeed. We gave her a quarter grain of morphin and 1/150 of atropin preparatory to ether anesthesia.

Her abdomen was opened and a porro-cesarean, or a modification of that operation, was done. There were no difficulties on the ground of technic. It was the simplest hysterectomy I have ever done. The baby was delivered in about two and a half or three minutes. It began to breathe, but its respirations did not pick up. The nurse worked on the baby for seven hours and did everything to increase respiration, but it did not increase. The baby was full term and weighed 6½ pounds and was perfectly formed. It died about seven hours later.

The mass extended underneath the diaphragm and the transverse colon was adherent to the top of the uterus. When that mass was delivered the transverse colon came with it. The adhesions were so dense that they had to be cut and ligated. The uterine arteries were very

*Presented in Case Report Session, Section on Obstetrics, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

large. She did not lose any blood, except a little from the venous radicles of the uterine wall. The whole procedure was completed in 32 minutes. Most of this time was consumed in closing carefully the large opening in the anterior abdominal wall. The woman reacted from the anesthetic and admitted that she knew the baby was there, but on account of being unmarried she did not wish to admit it. She had no nausea and immediately started to take fluids by mouth. I went back at three—four hours later—and her pulse rate was 140. At four she was bright, presented no appearance of shock, and was ready to talk. I went again at five to see how the baby was doing. I thought she was all right. At 6:30, about eight hours after she left the table, in the midst of a conversation with the nurse, she said her back was paining and asked that it be rubbed. She then gasped about four times, and died.

If I omitted anything in the handling of this case I should like to know about it from some of the older men. I should like to know if any of you think the baby's slow respiration was due to the morphia given preliminary to the anesthetic, or was it due to the pressure exerted by the tumors? The tumors and the baby weighed 17¼ pounds. The pediatrician made out the death certificate and wrote "Surgical shock." I do not agree with him.

DISCUSSION

Dr. George C. Mosher, Kansas City, Mo.—I think as far as the mother is concerned, the handling of the case was correct. As far as the death of the child is concerned, it is a lesson about the use of an opiate within an hour of the birth of a child. I have been using scopolamin and morphin for ten years, and recently I have practically given up using opiates together with scopolamin anesthesia. If I require anything I use pantopon, which has this advantage, according to the experiments by Dr. Macht, of the Department of Pharmacology at Johns Hopkins, that it is a respiratory stimulant instead of a depressant. There is no question that the Doctor's technic is to be commended throughout; that the child's death was caused by the use of morphin and the mother's by an embolism. The two were not due to an identical cause.

Dr. George F. Pendleton, Kansas City, Mo.—I would call it a case of pulmonary embolism. That is the one thing the surgeon is continually in fear of, especially in the pregnant condition and after operation.

One point was brought out: after cesarean why is it that it is so difficult to make the baby breathe? Why is it that it takes time to resuscitate the baby, when after ordinary delivery the baby cries right away, even though the patient has been under a deep, long-continued anesthesia?

Dr. Calvin R. Hannah, Dallas, Tex.—I was invited to see a cesarean section once. When the anesthetic was started and the abdomen exposed, the surgeon said, "That is a fine baby. See it kick." When the fetus was removed it took an hour to resuscitate it. Evidently it was due to the anesthetic's being forced on the woman and the baby's oxygen cut off. My advice is a caution that the fetus must have oxygen until it is removed.

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Eighteenth Annual Meeting, New Orleans, La.
November 10-13, 1924

THE NEW PRESIDENT, DR. CHAS. L. MINOR

The last but by no means the least important act of a meeting of the Southern Medical Association is the choosing of its officers for the ensuing year. It has been the custom to select each year the outstanding member who has achieved eminence in the profession and who has been closely identified with the growth and upbuilding of the Association. Usually the feeling is spontaneous that so-and-so is the one most deserving of the honor and most worthy of presiding over a great organization. It is the pride and boast of the Association that "politics" has never played a conspicuous part in the choice of officers.

The medical profession of the South was pleased to learn through the press that Dr. Charles L. Minor, of Asheville, N. C., had been elected President for 1924. A better selection could not have been made, for Dr. Minor is a gentleman of broad culture, of rare literary and artistic taste, an able writer, and above all an internationally known expert on pulmonary tuberculosis. Few men of his generation have shed more luster upon Southern medicine than he. Wherever tuberculosis is studied his name and fame have spread. Those who attended the Asheville meeting in 1919 will recall him as the gracious and scholarly gentleman who delivered the address of welcome.

While a Southerner by extraction, rearing and education, Dr. Minor was actually born in Brooklyn, N. Y., May 10, 1865, the son of Dr. James Monroe Minor and Ellen Josephine Pierrepont Minor. It is a disputed point whether the Minors are of pure English or of still more remote Dutch origin, latest investigation rather pointing to the latter, but certain it is that no Virginia family has furnished more or abler men than it. One of them, a former professor at the University of Virginia, has often been pronounced the greatest teacher of law which America has yet produced.

Dr. Minor was educated at the famous old Episcopal High School at Alexandria, Va., and at the University of Virginia, where he later studied medicine and was graduated in 1888. He was a member of the Delta Psi Fraternity and was elected to Phi Beta Kappa. From 1888 to 1890 he was House Surgeon at St. Luke's Hospital, New York City. He studied in Vienna hospitals from 1890 to 1892.

After having practiced in Washington, D. C., for three years, in 1895 Dr. Minor moved to Asheville, N. C., where he has lived and become famous.

In 1890 he was married to Miss Mary McDowell Venable, of Virginia. They have a son, also a physician, who resides in Washington, D. C.

Many honors have befallen Dr. Minor, among which may be mentioned the presidency of the American Climatological Association in 1912-13, and the National Association for Study and Prevention of Tuberculosis in 1917-18.

In addition to various shorter essays on medical subjects, Dr. Minor contributed the chapters on "Symptoms and Diagnosis" for Klebs' "Tuberculosis," in 1909.

Dr. Minor has long been a pillar of the Episcopal Church of Asheville. During the World War he presented the American Red Cross with an ambulance.

The impression one gains at once on meeting him, and which is further confirmed on closer acquaintance, is that he is essentially sympathetic and human, that he possesses a big heart, that he is a truly great man in mind and purpose, and that there is no phase of human life that does not interest him. In short, he is a man for whom one instinctively feels respect and for whom one very soon comes to feel an affectionate regard.

Members of the Association may rest assured that in 1924 the affairs of their organization will be presided over by a capable and energetic man who is deeply interested in helping build an ever greater Association.

THE SEVENTEENTH ANNUAL MEETING

Another milestone is passed. Nearly two thousand members of the Southern Medical Association put aside their work at home to gather together in a great city, to give and gain information and stimulation.

The meeting actually began on November 11 with the arrival in Washington of various special trains from over the South bringing physicians and their families from many states. Old friends renewed their friendships, and new friends met with a feeling of warmth and comradeship that is peculiar to a gathering of the Southern Medical Association.

The handicaps of a pouring rain and the early morning hour did not prevent the Medical Society of the District of Columbia almost in full force from meeting the President's Special and other trains. The street was lined on both sides with private automobiles to deliver the visitors to their hotels. With the exception of the first day the weather was perfect.

There were clinics in Baltimore and papers in Washington on Monday. The best of general meetings presided over by Dr. Leathers, the President, Monday night held the attention of physician and layman alike.

SCIENTIFIC EXHIBITS

The Scientific Exhibits were an education in themselves. The first award went to the Department of Pathology of the Medical School of Vanderbilt University, Nashville, Tenn. The Medical Department of the United States Army, the Army Medical Museum, received the second award. The third place went to Dr. A. I. Dodson, of St. Elizabeth Hospital, Richmond, Va.

COMMERCIAL EXHIBITS

The Commercial Exhibits included the new books of the year, the latest in basal metabolism apparatus, medical and surgical appliances, food for infants and invalids, reagents for delicate tests from hydrogen-ion indicators with such names as dimethylamido - azobenzol-o-carboxylic acid to purified sodium chlorid, and courteous attendants to explain and demonstrate the uses of all of these.

PERSONNEL OF THE MEETING

Distinguished guests from the North, South, East and West (even from Ireland) lent their points of view to the meeting. Differences of opinion arose in all the sections, and the warmth of the discussions gave an impetus to the search for truth in which all those present are engaged. As Dr. Geo. Vincent, President of the Rockefeller Foundation, said in substance, in sociology, religion and po-

litical economy a person may discover a new truth every year and critics cannot disprove them, but in medicine others have a disconcerting way of checking up the discoveries.

WASHINGTON HOSPITALITY

The women of Washington were no less hospitable than their husbands. Public characters not affiliated with the medical world were as kindly as were the wives of the hosts. The notable reception of President and Mrs. Coolidge will long be remembered, as will the courtesy and thoughtfulness of many other men and women who showered attention upon the visitors. Washington, being a city of conventions, might easily have turned a weary shoulder to this additional onslaught of physicians from the South. Never has more cordiality and consideration been shown an Association meeting. This spirit of friendliness with the splendid hotel facilities and Washington's scenic and historic interest combined to make the meeting delightful to all from beginning to end.

CLINICS AND ENTERTAINMENT ELSEWHERE

Baltimore was certainly not outdone by Washington in its hospitality to its guests. This Mecca of physicians had outdone itself to provide interesting and instructive clinics. For two days following the regular meeting the University of Maryland and its allied hospitals and the Johns Hopkins Hospital provided clinics and demonstrations. Further South the University of Virginia also set aside two days for clinics for those who were fortunate enough to stop over for them. Only lack of space prevents a detailed description of these highly instructive clinics, for which many a physician feels grateful.

Mention should be made of the delightful informal buffet dinner given by the Baltimore profession to the physicians and their families at Osler Hall, and of the tea and automobile ride which the women of Baltimore arranged for the visiting ladies.

NEW OFFICERS

For the ensuing year Dr. Charles L. Minor, of Asheville, N. C., was elected President; Dr. R. C. Lynch, of New Orleans, La., First Vice-President; and Dr. Thomas A. Groover, of Washington, D. C., Second Vice-President. Elsewhere in this issue will be found a picture of Dr. Minor and a brief biography of him.

NEXT MEETING PLACE

New Orleans, La., was chosen for the 1924 meeting. It is not too early to plan to attend the next gathering of an Association which has become so broad in its scope as to draw many physicians annually as visitors from distant states, and which is generally conceded to hold the most enjoyable conventions of any large medical organization in existence.

RADIOGRAPHIC TECHNIC

Since duplitized films have come into general use, the radiologist of reputation receives almost daily through the mail a series of films for interpretation. He is given a brief history of the case and in many instances is asked to make a diagnosis and give prognosis and treatment from poor or unreadable films. It is of the greatest importance to produce high-class films technically, as it is next to impossible properly to interpret poor films. From technically good films a positive or negative diagnosis can more readily be made without the necessity of an outside conference.

The most frequent causes of poor films are over-exposure and improper and rough handling in the dark room. It is important to have a correct position of the part to be examined, and to have the patient made comfortable to prevent too much muscle tension which may result in

movement during exposure. If the picture is of a movable part near the respiratory system, a systematic drill in breath-holding at moderate inspiration should be given before any attempt at exposure is made. All exposures of the head, neck, shoulders, chest, stomach and kidneys can be improved greatly by making exposure while the breath is held in moderate inspiration. Where a full inspiration is attempted, muscle tremor is sure to be present and blur the film, which will be evidenced by double shadows or fuzziness at the margins. In addition to the above, the head should be fixed by head clamps in head and sinus films.

In the dark room the film should be handled gently with clean, dry hands. It is dragged to the film holder rather than lifted by one end. The latter method will cause a definite click of the film and a crescentic "buck on the film" near where it was held by the fingers, which shows as a whitish blur or fog.

The developing solution, rinse-water, hypo-solution and wash-water should be between sixty-five and seventy degrees Fahrenheit, tested with a bath thermometer. Results cannot be obtained by attempting to test the temperature of the various solutions with the hands. In the territory covered by the Southern Medical Association it is necessary approximately six months of the year to use ice or some other cooling process to produce a temperature of sixty-five or seventy degrees. Better results will be obtained even through the winter months if the temperature is always determined by a bath thermometer.

A close observance of the above few technical points will produce much more readable films. A radiologist who is frequently asked to confer on films from other laboratories wastes much time trying to interpret poor films and upon long diplomatic letters to the roentgenologists who sent them.

The technical production of good films may be sometimes irksome, but the effort is always fully repaid in the immediately resulting improvement in diagnostic worth.

THE FAITHFUL OF 1923

In this final issue of the year, the JOURNAL would be ungrateful to a degree were it to fail to make acknowledgment of the invaluable assistance which the Editorial Department has received from certain loyal supporters. The obligation is all the deeper because the aid rendered was given as a labor of love with no hope of reward or recognition.

The response of those who were asked to assist the JOURNAL either by an editorial, data for one, or the suggestion of a subject, was most gratifying. Without this help along the lines of internal medicine, surgery, public health, x-ray, eye, ear, nose and throat, pediatrics, obstetrics, and in fact most of the specialties, the Editorial Section would have suffered sadly.

The JOURNAL has during the past year received one or more editorials or valuable suggestions from the following, to whom it wishes to express publicly its indebtedness and appreciation:

Dr. Lewellys F. Barker, Baltimore, Md.
Dr. J. W. Barksdale, Jackson, Miss.
Dr. Frank K. Boland, Atlanta, Ga.
Dr. H. R. Carter, Washington, D. C.
Dr. M. T. Davidson, Birmingham, Ala.
Dr. L. D. Fricks, U.S.P.H.S., Memphis, Tenn.
Dr. Julius Friedenwald, Baltimore, Md.
Dr. Seale Harris, Birmingham, Ala.
Dr. Fred G. Hodgson, Atlanta, Ga.
Dr. J. W. Jervey, Greenville, S. C.
Dr. Elizabeth Kane, Memphis, Tenn.
Dr. D. Y. Keith, Louisville, Ky.
Dr. J. E. Knighton, Shreveport, La.
Dr. W. Hamilton Long, Louisville, Ky.
Dr. L. J. Moorman, Oklahoma City, Okla.

Dr. R. H. McGinnis, Jacksonville, Fla.
Dr. Edward Speidel, Louisville, Ky.
Dr. Beverley R. Tucker, Richmond, Va.
Dr. J. Russell Verbrycke, Jr., Washington, D. C.
Dr. A. A. Walker, Birmingham, Ala.
Dr. Chas. A. Waters, Baltimore, Md.
Dr. Robert Wilson, Jr., Charleston, S. C.

Correspondence

HEALTH CONTRACTS

Editor, SOUTHERN MEDICAL JOURNAL:

Recently the daily press contained the statement that the president of one of the large railroad equipment companies in Philadelphia, a man of 67, who is stronger and more active now than he was five years ago, attributes his better health to a special contract made with his physician.

On finding, several years ago, that his health was failing, this leader of industry consulted his physician and suggested making a contract with him for the supervision of his life with a view to the maintenance of his health for the following decade. The industrialist offered to pay to the supervising physician a certain sum each year, this sum to be increased every year because of the fact that the older he grew the greater, in all probability, the difficulty of keeping him in good health. If he were to become ill the annual retainer was to be reduced according to the length of the illness.

The physician accepted the offer. He has since examined the man at intervals of not less than two weeks and it is asserted that, since the contract was entered upon, the patient has followed instructions conscientiously and has not lost a single day from work.

Such a contract suggests the method of payment of physicians said to be in vogue in China, where the doctors are paid as long as the patients of whom they have charge keep well, but are not paid when their patients are ill.

Whether or not such a form of contract between physician and patient as that referred to above is likely to become popular in the United States it is difficult to say. But that business men and professional men generally would do well to enter into some arrangement with their physicians through which they would submit to periodic health examinations and would follow the dietetic-hygienic regimes prescribed for them goes without saying.

A contract embodying an annual retaining fee would seem to be unobjectionable, though that this fee should be reduced if the patient should become ill despite the best efforts of his physician would seem to be unfair to the latter. For, assuming that the annual retainer is a fair compensation for the making of the periodic examinations and for the careful supervision of the client's mode of life, it would seem that when unpreventable illness occurs the physician should receive additional remuneration for the extra work it entails rather than be penalized for what is not his fault.

The laity will not be benefited by believing that all disease can be prevented even by the most competent physician who examines persons when they are in health and prescribes the mode of life that they are to follow. That *much* disease could be prevented by periodic health examinations is undoubtedly true; but that in the present state of medical science and art all disease could be abolished by such practice is wholly untrue. Medical men must take care not to mislead laymen into ill-founded expectations, and they should see to it that in their contractual relations there is no intimation of promises that cannot be kept.

LEWELLYS F. BARKER, M.D.
Baltimore, Md., Oct. 24, 1923.

Book Reviews

Pediatrics. Edited by Isaac A. Abt, Professor, Diseases of Children, Northwestern University Medical School, Chicago; Attending Physician, Sarah Morris Hospital for Children of Michael Reese Hospital, Chicago. By 150 specialists. In eight octavo volumes, totaling 8,000 pages, with 1,500 illustrations, and separate desk index volume free. Volume I, 1,240 pages, with 284 illustrations. Volume II, 1,025 pages, with 180 illustrations. Philadelphia and London: W. B. Saunders Co., 1923. Cloth, $10.00 per volume.

This is a splendid compilation of the pediatric knowledge of the day; in fact, a system of pediatrics. It is edited by a well-known authority on pediatrics, and its separate chapters are written by the best known specialists from different parts of the country, men who have influenced the thought of the day, and who have contributed largely to the store of knowledge contained in the volumes.

Volume I discusses general principles underlying pediatrics, its history, problems of heredity, anatomy, growth, metabolism, relation of physical chemistry to the physiology of childhood, and problems of climate hygiene of well and crippled children of various ages. Its contributors are Isaac A. Abt, Fielding H. Garrison, Clarence C. Little, Richard E. Scammon, T. Brailsford Robertson, John R. Murlin, Jesse F. McClendon, Walter Reeve Ramsey, Josephine E. Young, Frederick L. Wakeham and H. Winnett Orr. The chapter on congenital and acquired predisposition and heredity is well handled. The effects of radiation and of alcoholism on heredity, the modification of the sex ratio, the difference between transmission and heredity (syphilis, e. g., being considered as transmitted by the germ cells, not inherited, and a tendency to the formation of specific sorts of neoplasms being inherited) and inheritance of Mendelian traits in general are thoroughly considered. The chapter on metabolism and metabolism apparatus is complete and well illustrated.

Volume II contains more specific information for the practitioner. Here again the names of the authors are familiar to students of medicine in general as well as to pediatricians. There is a chapter on the mortalities of infancy, by Richard Arthur Bolt. Quoting Sir Arthur Newsholme, it is stated that "infant mortality is the most sensitive index we possess of social welfare and of sanitary administration, especially under urban conditions." The decrease of the mortality and morbidity rate among infants decreases it among the older children. Relations of various factors to infant mortality are given.

The chapter on history taking and the physical examination of infants and children, an important and often neglected subject, by Mark Jampolis, contains very specific directions and illustrations. The cerebrospinal fluid, roent-

genology and disease peculiarities, respectively, are ably treated by Abraham Levinson, Frederick C. Rodda and John Diven. A chapter on prophylaxis and treatment by Dr. L. R. DeBuys contains a list of drugs for internal and external use, and indicates the proper dose for infants of various ages. In the chapter on heliotherapy, Dr. Henry Dietrich describes the work of Rollier, the master of this art, and the effect upon local lesions of its proper application. Diseases of the newborn, by Dr. N. O. Pearce; premature infants, by Dr. Julius Hess; and chemistry and biology of milk, by Paul G. Heineman, are excellent.

The most read chapter in the second volume should be that by Drs. Julius P. Sedgwick and W. C. C. Cole, on breast feeding and nutrition. Dr. Sedgwick has for some time practiced his theory that proper stimulation of the breasts by periodic emptying will enable practically every mother successfully to nurse her baby.

The chapter on artificial feeding, by Dr. Joseph Brennemann, gives the history and discarded methods of artificial feeding, fairly briefly the methods and practices now current, and ably discusses the additional and supplemental feedings to be given in infancy and childhood. The statement, "One does not know how to feed a baby till one follows the hunch rather than one's scientific knowledge," is to be regretted. "That they [eggs] are a wholly unnecessary article of diet is certain," might suggest an argument. The expression, "easier to digest," is too loosely used to have much meaning and should be avoided in pediatrics. A few articles are mentioned as objectionable for infants of certain ages, which might suggest differences of opinion among pediatricians, but the chapter on the whole is well balanced and free from the prejudice and pointless taboos with which the literature of the past decade has been filled.

The chapter on diabetes mellitus by Solomon Strouse reviews the subject well, but contains only a brief reference to insulin treatment. Diabetes insipidus is described by Dr. Max Kahn; seasickness, by W. J. Corcoran; beriberi, by Dr. E. B. Vedder; acidosis, by Dr. John Howland and Dr. W. McKim Marriott; obesity, by Dr. T. C. Hempelmann; infantile scurvy and rickets, in two chapters, by Dr. Alfred Hess. Dr. J. Ross Snyder gives a thorough and unbiased discussion of pellagra, with its history, etiology and treatment, amply illustrated.

The constitutional diatheses of childhood, by Dr. Frederic Schultz, and acrodynia, by William Weston, conclude the book.

It is of interest to the Association that, although the plans of this work orginated in Chicago, the South is well represented among its contributors. Dr. Richard Bolt, of Johns Hopkins University; Dr. Fielding H. Garrison, of Washington; Dr. L. R. DeBuys, of Tulane University, New Orleans; Dr. John Howland, of Johns Hopkins University; Dr. W. McKim Marriott, of St. Louis; Dr. J. Ross Snyder, of Birmingham, Ala., and Dr. William Weston, of Columbia, S. C., are physicians whom the South and the Southern Medical Association are very proud to claim.

The two volumes represent a modern system of pediatrics, ably written and ably edited. Although the authors are from every part of the country, there is practically no repetition or duplication of ground in any of the chapters. Since it deals largely with well grounded facts, its wisdom may be supplemented, but should not for many years be superseded.

Exercise in Education and Medicine. By R. Tait McKenzie, M.D., LL.D., McGill University; late Major, R.A.M.C.; Professor of Physical Education and Physical Therapy and Director of the Department of Physical Education, University of Pennsylvania; F.A.C.P. of Philadelphia; President, American Physical Education Association, 1913-1915; President, Society of Directors of Physical Education in Colleges, 1912; Sometime Lecturer in Anatomy and Medical Director of Physical Education, McGill University; Lecturer in Artistic Anatomy, Montreal Art Association, Harvard Summer School, and Olympic Lecture Course, St. Louis, 1904; M.P.E., Springfield College. Octavo of 601 pages, with 445 illustrations. Third edition. Philadelphia and London: W. B. Saunders Co., 1923. Cloth, $5.00 net.

Speaking of exercise as the "Cinderella of the therapeutic family," Dr. McKenzie here puts the glass slipper on her and shows her real position as a curative and preventive agent. He defines exercise as comprising "all movements, voluntary or passive, including manipulations by the hand of an operator or by a machine, designed to act on the muscles, the blood vessels, the nervous system, the skin and the abdominal organs." Games useful in schools and in camps are described, as well as exercises for correcting different abnormalities from injuries, etc. For instance, pulley weights for exercising each finger are shown in illustration. A worth while subject in this book is efficiently covered.

Mental Hygiene and the Public Health Nurse. Practical Suggestions for the Nurse of Today. By V. May Mac Donald, R.N., Formerly Assistant Superintendent of Nurses, Johns Hopkins Hospital; Formerly Secretary of the Connecticut Society for Mental Hygiene; Lately Organizer of Social Work, National Committee for Mental Hygiene. With a Foreword by Thomas W. Solman, M.D., Professor of Psychiatry, Columbia University; Lately Medical Director, Committee for Mental Hygiene. 67 pages. Philadelphia, London and Chicago: J. B. Lippincott Co., 1923. Cloth, $1.50.

The book is divided into two sections, the first being "The Public Health Nurse and Mental Disorders," in which are discussed the economic aspects of mental disorders, the need of training the public to the proper aspect toward these conditions, and the responsibility and field of usefulness of the public health nurse in this regard.

The second section takes up "The Public Health Nurse and Mental Health." This is divided into four sections: mental health of children, preventable forms of mental disorders, mental defectives and opportunities for giving instruction in mental hygiene.

Although written in an elementary manner, it is seldom that one finds a little volume fulfilling its mission in so clear and practical a form as does this manual. The author has added a book which should be of use not only to the public health nurse, but to all those persons whose duties bring them into contact with large numbers of individuals.

Asthma. By Frank Coke, F.R.C.S. New York: William Wood & Co., 1923.

The author states that the purpose of the book is to bring before the general practitioner the latest method of diagnosing and treating the disease, asthma. The book is a resume of 350 cases in the author's hands, with a fairly extensive reference to the literature covering the subject. It has a great deal of superfluous material, and could well have been condensed into a volume of much smaller size and equally well have served the purpose for which it is written.

The author leaves the impression that in the use of vaccines with the coliform vaccine (intestinal vaccine) he has had his greatest success. This has not been the experience of the American writers, as they claim the greatest benefit from vaccine made from the sputa.

Asthma is a condition that has always puzzled the medical world, and hence any work that will be of aid in instructing the general practitioner in handling this baffling disease is to be welcomed.

Introduction to the Histology and Histopathology of the Nervous System. By Dr. Paul Schroder, Professor of Psychiatry and Neurology in Greifswald. Authorized Translation from the second German edition, by Baldwin Lucke, M.D., Assistant Professor of Pathology, School of Medicine, University of Pennsylvania; and Morton McCutcheon, M.D., Instructor in Pathology, School of Medicine, University of Pennsylvania. With 56 illustrations and 161 pages. Philadelphia and London: J. B. Lippincott & Co., 1923.

The book, as the author states in his preface, is an introduction to the subject which was originally given in the form of lectures. The subject is fairly well presented, but it is doubtful that there is any need of this particular type of book.

A Text Book of Anatomy and Physiology for Schools of Nursing, Normal Schools and Colleges. By Jesse Feiring Williams, M.D., Professor of Physical Education, Teachers' College, Columbia University, New York City. With 369 illustrations, 25 in colors. Philadelphia and London: W. B. Saunders Co., 1923. Cloth, $3.00.

The subject is handled in more detail than is usual in this type of book. The manner of presentation shows that the author is familiar with the instruction of nurses, which is a problem differing greatly from that of teaching medical students.

The book deserves a wide popularity as a text.

The Medical Clinics of North America. Chicago Number, Vol. VII, No. 2, September, 1923, and No. 3, November, 1923. Philadelphia and London: W. B. Saunders Co. Bi-monthly, $12.00 a year.

The present volume is well up to the standard set for this publication. Subjects in many fields of medicine are covered, and in papers of such merit that it is impossible to mention one as being better than the rest, except where one's personal interest might cause a partiality.

Introduction to Medical Biometry and Statistics. By Raymond Pearl, Professor of Biometry and Vital Statistics in the School of Hygiene and Public Health, and Biology in the Medical School, Johns Hopkins University. Illustrated with 70 text figures. 379 pages. Philadelphia and London: W. B. Saunders Co., 1923. Cloth, $5.00 net.

The author is internationally recognized as an authority on the subjects which he presents in this book. It is written primarily for the medical profession, and therefore the mathematical side of the problem is never allowed to supplant the practical application of the subject.

The first sections are given over to the history and development of biometry and statistics, collection of data and methods of presentation in tabular form. Next follows a section on mechanical tabulation. The section on graphical representation of statistical data is a model of clearness.

The author's discussion of life tables and standard and corrected death rates is helpful, and it is something that could be read with advantage by all members of the medical profession.

The remaining chapters are devoted to the theory of probability, measurement of variation and correction and partial correlations. This section of the book is presented as clearly and simply as is possible with such subjects.

The book is one that should be of great value to health officers and others who use these methods, as well as being worthy of close study by all members of the medical profession.

The Bacteriophage: Its Role in Immunity. By F. d'Herelle, Pasteur Institute. English Edition. Translated by George H. Smith, Ph.D., Assistant Professor of Bacteriology and Pathology, Yale University, School of Medicine. 287 pages. Baltimore: Williams & Wilkins Company, 1922.

The d'Herelle phenomenon, so-called, consists in the rapid and complete disappearance of bacteria from cultures following the addition thereto of minute amounts of a filtrate from cultures of an homologous organism or even of similar preparations from cultures of a different species. The fact that such destruction of bacteria occurs under the given conditions is not disputed by workers who have repeated d'Herelle's experiments. There is, however, considerable disagreement as to the explanation. D'Herelle is firm in his belief that the observed process depends on the presence within the filtrate of an ultramicroscopic living body that exists as an obligatory parasite preying upon the bacteria and bringing about their dissolution. The author describes the experimental methods by which he has been able to isolate the "bacteriophage," as he calls this ultra-parasite; to count it numerically; to study its "virulence;" its resistance or susceptibility to the harmful action of physical agents. He defines even the immunity reactions taking place between it and the bacteria upon which it feeds, and outlines its direct and indirect share in the defensive reactions of the animal body.

The bacteriophage, according to the author's conception, is a normal inhabitant of the intestinal tract of all animals, vertebrate and invertebrate. It exists as a single species, which is, however, capable of acquiring specific "virulence" for different organisms as the need arises or the presence of a given bacterial invasion offers it a host upon which it can feed. When it has found such a host its lysins dissolve the bacterial substance, and the resulting products of bacterial disintegration initiate reactions of the types recognized in the older theories of immunity. Highly successful experiments are described in which the feeding or injection of a "culture" of the bacteriophage has protected animals and fowls against infection or cured them of infection already established. To a limited extent, the prophylactic and therapeutic experiments have been extended to man. Here also it is claimed that the results have been full of promise.

The book sketches an interesting field of immunologic theory. Could the fundamental facts be established, we might expect the study of the bacteriophage to yield us great advances in theoretical bacteriology and bacteriologic technic as well as in the practical therapeutic handling of certain infections. It is probable, however, that the average reader will remain more or less skeptical until we have more extended confirmation of the data thus far collected.

The Evolution and Significance of the Modern Public Health Campaign. By C. E. A. Winslow, Dr. P.H., Professor of Public Health, Yale School of Medicine. 65 pages, New Haven: Yale University Press. London: Humphrey Milford, Oxford University Press, 1923. Cloth, $1.50.

This volume is the sixth to be published under the Williams Memorial Publication Fund by the Yale University Press.

The author divides his subject under the following headings: The Dark Ages of Public Health; The Great Sanitary Awakening; Pasteur and the Scientific Basis of Prevention; The Golden Age of Bacteriology; The New Public Health.

For a general survey of the development of public health the book is to be commended, but there is one omission which is difficult to understand. Under the heading of "The New Public Health" there is discussed the work of Major Walter Reed and his associates of the board which proved the Aedes Aegypti the vector in the transmission of yellow fever. However, nowhere is there any reference to the monumental work of Sir Ronald Ross on malaria, which constitutes an omission of one of the most far-reaching pieces of work in medical science.

The text is clearly written and the book is worth reading.

The Tonsils, Faucial, Lingual and Pharyngeal. With Some Account of the Posterial and Lateral Pharyngeal Nodules. By Harry A. Barnes, M.D., Instructor in Laryngology, Harvard Medical School; Laryngologist, Massachusetts Charitable Eye and Ear Infirmary; Laryngologist, Massachusetts General Hospital; Member New England Laryngological and Otological Society; Member American Laryngological, Rhinological and Otological Society; Member American Laryngological Association. Illustrated. Second Edition. St. Louis: C. V. Mosby Co. 1923. Cloth, $5.00.

Since the first edition of this book was published, nine years ago, there has been a tendency toward greater uniformity of opinion on the tonsils, and the operations for their removal have been improved and more or less standardized. Several new operations have appeared, notably the capsule splitting operation and those based on this principle so well enunciated by Makuen in 1915. Time has given us material for a sounder judgment on the relations of the tonsils to focal infections. Radiation as a means of producing atrophy of the lymphoid tissues has appeared and is even yet on trial. This edition of the tonsils reflects all of these changes. Much that is new has been added to the sections on operations, their sequelae and complications. The newer operations, as the old, are described at length, and the technic of local anesthesia has received special attention. The chapter on focal infections has been practically rewritten. The section on the x-ray and radium treatment of tonsillar hypertrophy is, of course, new. A number of plates illustrative of operative technic have been added.

Heart Records, Their Interpretation and Preparation. By S. Calvin Smith, M.S., M.D., Philadelphia, Author of "Heart Affections: Their Recognition and Treatment." Containing 126 original illustrations and 311 pages. Philadelphia: F. A. Davis Co., 1923. Cloth, $7.00.

The author states in his preface that the book is written as "an elementary guide for those who would investigate the most recent of many methods of heart examination." The book takes up the interpretation of normal and abnormal electrographic records in a very elementary manner. Then follow six chapters devoted to the technical records of installation and operation of the electrocardiograph, developing of records, and printing and filing them.

For the physician who wants to learn the application of the graphic methods to clinical medicine this section of the book is a real advantage. For one who is familiar with the technical side of the electrocardiograph it is useless, as the same directions are usually sent by the manufacturer with the instrument. The author stresses one point of real importance in that he calls attention to the fact that there should never be a simple "graphic diagnosis" submitted from the record alone.

The sections allotted to consideration of the polygraph and polygraphic tracings are not clearly written and give the impression that they were added as an afterthought.

International Clinics. Vol. II. 33d Series. 37 Illustrations. 312 pages. Philadelphia and London: J. B. Lippincott Co., 1923.

The clinics presented in this volume are not up to the usual standard that one has been accustomed to expect of this publication. The best of them is a paper by W. Storm Van Leeuwen, of Leiden, Holland, on "The Therapy of Allergic Diseases," which is a continuation of his presentation of the same subject in the June, 1922, number of this publication.

Excursions Into Surgical Subjects. By John B. Deaver, M.D., Emeritus Professor of Surgery, University of Pennsylvania; Surgeon-in-Chief, Lankenau Hospital, Philadelphia; and Stanley P. Rieman, M.D., Assistant Professor of Experimental Pathology, University of Pennsylvania; Chief of the Department of Pathology and Bacteriology, Lankenau Hospital, Philadelphia. Octavo volume of 188 pages and 30 illustrations. Philadelphia and London: W. B. Saunders Co., 1923. Cloth, $4.50 net.

This is an authoritative book compiled in part from lectures to graduate students in Washington University, Seattle, Wash. The print is most agreeably large. The subjects covered are peptic ulcer, jaundice, diseases of the bile passages, some surgical conditions of the intestinal tract. A chapter is devoted to living pathology, and there are two historical chapters. There is also a good index.

The authors of this volume have made a useful contribution to surgical literature.

Tonsillectomy by Means of the Alveolar Eminence of the Mandible and a Guillotine. With a Review of the Collateral Issues. By Greenfield Sluder, M.D., F.A.C.S., Clinical Professor and Director of the Department of Rhinology, Laryngology and Otology, Washington University School of Medicine, St. Louis, Mo. With 90 illustrations. St. Louis: C. V. Mosby Co., 1923. Cloth, $5.00.

In the author's own words, "The object of this monograph is to present satisfactorily 'The Method of Tonsillectomy by Means of the Alveolar Eminence of the Mandible and a Guillotine.'" With characteristic thoroughness he has succeeded in doing so. Sluder's contributions are always of inestimable value, and this monograph is no exception. In addition to the stated object of this monograph, the author has reviewed collateral issues such as embryology, comparative anatomy, general human anatomy, physiology, pathology, clinical laryngology and surgery.

Exercise for Health and Correction. By Frank D. Dickson, M.D., and Rex L. Diveley, M.D. Illustrated with 114 photographs. 127 pages. Philadelphia and London: J. B. Lippincott Co., 1923.

This is another manual on exercise added to an already large list. It gives the authors' opinions of the proper exercises to be taken. Although it is a safe guide, the exact justification for its publication seems hard to determine.

Other Books Received

Papers on Psycho-analysis. By Ernest Jones, M.D., M. R. C. P. (Lond.), President, International Psycho-analytical Association and of the British Psycho-analytical Society; Editor, International Journal of Psycho-analysis. Third edition, with 730 pages. New York: William Wood & Co., 1923. Cloth, $8.00 net.

The Chemical Basis of Growth and Senescence. By T. Brailsford Robertson, Ph.D., D.Sc., Professor of Physiology and Biochemistry, University of Adelaide, South Australia. With 390 pages. Philadelphia and London: J. B. Lippincott & Co., 1923. Cloth, $3.00.

Principles of Bacteriology. By Arthur A. Eisenberg, A.B., M.D., Director of Laboratories, St. John's Hospital; Pathologist to Lakewood Hospital; Serologist to St. Ann's Hospital, Cleveland, Ohio; Director of Laboratories, Mercy Hospital, Canton, Ohio. Second edition, with 214 pages, illustrated. St. Louis: C. V. Mosby Co., 1923. Cloth, $2.25.

Diseases of the Rectum and Colon, and Their Surgical Treatment. By P. Lockhart-Mummery, F.R.C.S., Eng., M.A., M.B., B.C. Cantab; Senior Surgeon to St. Mark's Hospital for Cancer, Fistula and Diseases of the Rectum, etc. With 870 pages, illustrated. New York: William Wood & Co., 1923. Cloth, $8.00.

Diagnosis and Treatment of Acute Abdominal Diseases, Including Abdominal Injuries and the Complications of External Hernia. By Joseph E. Adams, M.B., M.S. Lond., F.R.C.S. Eng.; Surgeon to St. Thomas' Hospital; Senior Surgeon, East London Hospital for Children; Late Hunterian Professor, Royal College of Surgeons of England. Second edition, with 558 pages, illustrated. New York: William Wood & Co., 1923. Cloth, $6.00.

Rubber and Gutta Percha Injections. Subcutaneous Injections of Rubber and Gutta Percha for Raising the Depressed Nasal Bridge and Altering External Contours. By Charles Conrad Miller, M.D. Chicago: 1923. Cloth. $1.75.

Obstetrics for Nurses. By Charles B. Reed, M.D., Obstetrician to Wesley Memorial Hospital, Chicago. Second edition, with 390 pages and 144 illustrations, including two color plates. St. Louis: C. V. Mosby Co., 1923. Cloth, $3.50.

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A Treatise on the Diseases and Injuries of the Rectum, Anus and Pelvic Colon. By J. Rawson Pennington, M.D., F.A.C.S., Proctologist to Columbus Hospital, Veterans' Hospital No. 30, and U. S. Marine Hospital; Original Member and Past President American Proctologist Society; Fellow of the Chicago Society of Medical History; Corresponding Member, Royal Society of Medicine, London (Surgical Section); Formerly Professor of Rectal Diseases, Chicago Polyclinic. With two plates and 677 illustrations and 733 pages. Philadelphia: P. Blakiston's Son & Co., 1923. Cloth, $12.00.

A Manual of Proctology. By T. Chittenden Hill, Ph. B., M. D., F.R.C.S., Instructor in Proctology, Harvard Graduate School of Medicine; Surgeon to Rectal Department, Boston Dispensary; Ex-President American Proctologic Society. With 279 pages, illustrated with 84 engravings. Philadelphia and New York: Lea & Febiger, 1923. Cloth, $3.25.

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Physical Diagnosis. By Richard C. Cabot, M.D., Professor of Medicine in Harvard University; Formerly Chief of the West Medical Service at the Massachusetts General Hospital. Eighth edition, revised and enlarged, with 536 pages, six plates and 279 figures in the text. New York: William Wood & Co., 1923. Cloth, $5.00.

Blood Chemistry, Colorimetric Methods, for the General Practitioner. With Clinical Comments and Dietary Suggestions. By Willard J. Stone, M.D., Pasadena, Cal., Attending Physician, Los Angeles General Hospital. Introduction by George Dock, M.D., Pasadena, Cal. With 71 pages. New York: Paul B. Hoeber, 1923. Cloth, $2.25 net.

The Principles of Vital Statistics. By I. S. Falk, Ph.D., Department of Public Health, Yale University. With 256 pages, illustrated. Philadelphia and London: W. B. Saunders Co., 1923. Cloth, $2.50 net.

The Elements of Public Health Administration. By George Sparr Luckett, A.B., M.D., Director of Public Health, State of New Mexico; Charter Fellow American Public Health Association; and Harold Farnsworth Gray, B.S., M.S., Gr.P.H., Chief, Division of Sanitary Engineering and Sanitation, New Mexico Bureau of Public Health. With 460 pages. Philadelphia: P. Blakiston's Son & Co., 1923. Cloth, $3.00.

Teachers' Dietetic Guide, to accompany Pattee's Practical Dietetics. Containing State Board Requirements in Dietetics and State Board Examination Questions. Given gratis with each copy of Pattee's Practical Dietetics. Not sold separately. With 142 pages. Mt. Vernon, N. Y.: A. F. Pattee, 1923.

Habitual Constipation, Its Causes, Consequences, Prevention, and Rational Treatment. Set forth in non-technical language. By Ismar Boas, M.D., Professor of Medicine in Berlin. Translated by Thomas L. Stedman, M.D., Author of "A practical Medical Dictionary;" Editor of the "Reference Handbook of the Medical Sciences;" Formerly Editor of the Medical Record. With 298 pages, illustrated. New York and London: Funk & Wagnalls Co., 1923. Cloth, $2.00.

A Clinical Guide to Bedside Examination. By Dr. H. Elias, Dozent and Assistant at the First Medical Clinic of the University of Vienna, Austria; Dr. N. Jagic, Extraordinary Professor and Chief Physician to the Sofienspital, Vienna, Austria; and Dr. A. Luger, Dozent and Assistant at the Second Medical Clinic of the University of Vienna, Austria. Arranged and Translated by Wm. A. Brams, M.D., Chicago, Ill., Adjunct in Medicine, Michael Reese Hospital; Formerly Lieut. Commander, Medical Corps, U. S.N. With 135 pages. New York: Rebman Co., 1923.

The Normal Child, Its Care and Feeding. By Alan Brown, M.B., Physician in Chief to the Hospital for Sick Children, Toronto; Associate Professor of Medicine in Charge of Pediatrics, University of Toronto; Physician in Charge New-Born Clinic, Toronto General Hospital; Director, Department Child Hygiene, Local Board of Health; Consulting Pediatrist to the Provincial Board of Health, Ont., Riverdale Isolation Hospital, Women's College Hospital and St. Mary's Infant Home; Honorary Member North Coast Pacific Pediatric Society, Portland, Oregon. With 252 pages. New York and London: The Century Co., 1923. Cloth, $1.25.

Handbook of Surgery. By George L. Chiene, M.B., C.M., F.R.C.S. (Ed.), Surgeon, Edinburgh Royal Infirmary; Senior Lecturer and Examiner in Clinical Surgery, Edinburgh University; Examiner in Surgery and Clinical Surgery, R.C.S., Edinburgh; Formerly Assistant Surgeon, Royal Hospital for Sick Children, Edinburg; Extra Examiner in Surgery, Aberdeen University. With 592 pages, illustrated. New York: William Wood & Co. Edinburgh: E. & S. Livingstone, 1923. Price, $4.50.

Physiotherapy Technic. A Manual of Applied Physics. By C. M. Sampson, M.D., Formerly of the Physiotherapy Service, Walter Reed U. S. Army General Hospital, Washington, D. C.; Formerly Chief of Physiotherapy Service, U. S. Army General Hospital No. 9, Lakewood, N. J.; General Hospital No. 42, Fox Hills, Staten Island, N. Y., later Hoff General Hospital; Formerly Reconstruction Officer, U.S. P.H.S., Hospital No. 61, Fox Hills, Staten Island, N. Y., later U. S. Veterans' Bureau Hospital No. 61; Formerly in Charge Reconstruction U.S.P.H.S. Hospital No. 70, N. Y. C. With 440 pages and 85 illustrations. St. Louis: C. V. Mosby Co., 1923.

The Infant and Young Child. Its Care and Feeding from Birth Until School Age. A Manual for Mothers. By John Lovett Morse, A.M., M.D., Professor of Pediatrics, Emeritus, Harvard Medical School; Consulting Physician at the Floating, the Children's and Infants' Hospitals, Boston. And Lewis Webb Hill, M.D., Assistant in Pediatrics, Harvard Medical School; Junior Assistant Physician at the Children's Hospital; Visiting Physician at the Nursery for Blind Babies, Boston. With 270 pages, illustrated. Philadelphia and London: W. B. Saunders Co., 1923.

The International Medical Annual. A Year Book of Treatment and Practitioner's Index. Contributors: Drs. E. Wyllys Andrews, R. Barrieu, Joseph Blomfield, John D. Comrie, Carey F. Coombs, William E. Fothergill, Herbert French, Ernest W. Heygroves, O. C. Gruner, J. A. Hadfield, L. W. Harrison, C. Thurstan Holland, J. Ramsay Hunt, Robert Hutchinson, Frederick Langmead, Arthur Latham, Camille Liam, A. E. J. Lister, E. G. Graham Little, J. P. Lockhart-Mummery, Perisson, Pollet, Joseph Priestley, C. Stanford Read, Leonard Rogers, John D. Rolleston, C. Ernest Sundell, Loring T. Swaim, John Thomson-Walker, J. A. Torrens, W. I. de Courcy Wheeler, Andrew J. M. Wright. Associate Editors: Carey F. Coombs. M.D., F R.C.P. (Medicine), and R. Rendle Short, M.D., B.S., B.Sc., F.R.C.S. (Surgery). With 546 pages, illustrated. Forty-first year. New York: William Wood & Co., 1923. Cloth, $5.00 net.

A Textbook of Chemistry for Nurses. By Fraser N. Peters, A.M., Ph. D., Author of "Experimental Chemistry," "Laboratory Experiments," "Applied Chemistry," etc.; Formerly Professor of Chemistry and Director of Laboratories, Kansas City College of Pharmacy; Professor of Organic Chemistry, Hahnemann Medical College; Director of Laboratories and Professor of Chemistry and Metallurgy, Kansas City Dental College; Instructor in Chemistry in Kansas City Central High School for 25 years; More recently Vice-Principal. 301 pages, illustrated. Second edition. St. Louis: C. V. Mosby Co., 1923. Cloth, $2.25.

Practical Dietetics, with Reference to Diet in Health and Disease. By Alida Frances Pattee, Graduate, Department of Household Arts, State Normal School, Framingham, Mass.; Former Instructor at Mount Sinai, Hahnemann, and the Flower Hospital Training Schools for Nurses, New York City; Lakeside, St. Mary's, Trinity, and Wisconsin Training Schools for Nurses, Milwaukee, Wis.; St. Joseph's Hospital, Chicago, Ill.; St. Vincent de Paul Hospital, Brockville, Ont. 645 pages. Fourteenth Edition, Completely Revised. Mt. Vernon, N. Y.: A. F. Pattee, 1923.

Healthy Children. A Volume Devoted to the Health of the Growing Child. By S. Josephine Baker, M.D., D.P.H., Director, Bureau of Child Hygiene, Department of Health, New York City; Consultant in Child Hygiene, U.S. P.H.S.; Former President American Child Hygiene Association; Lecturer on Child Hygiene at Teachers' College, Columbia University, New York University and Bellevue Hospital Medical College. 225 pages, illustrated. Boston: Little, Brown & Co., 1923. Cloth, $1.25.

Healthy Babies. A Volume Devoted to the Health of the Expectant Mother and the Care and Welfare of the Child. By S. Josephine Baker, M.D., D.P.H., Director, Bureau of Child Hygiene, Department of Health, New York City; Consultant in Child Hygiene, U.S.P.H.S.; Former President American Child Hygiene Association; Lecturer on Child Hygiene at Teachers' College, Columbia University, New York University and Bellevue Hospital Medical College. 220 pages, Illustrated. Boston: Little, Brown & Co., 1923. Cloth, $1.25.

Transactions of the American Proctologic Society. Twenty-third Annual Session Held at Hotel Claridge, St. Louis, Mo., May 22 and 23, 1922. 121 pages. Contributions by Drs. Granville S. Hanes, Joseph F. Montague, Ralph W. Jackson, William M. Beach, John D. Stewart, James C. Minor, Joseph F. Saphir, Edward G. Martin, Charles E. Howard, John L. Jelks, Harry B. Adams, Walter A. Fansler, Collier F. Martin, Louis J. Hirschman, Harold E. Dunne, Daniel Morton, William H. Kiger, Rawson Pennington and Curtis C. Mechling. New York: Paul B. Hoeber, 1923. Cloth, $3.00.

Is Coue a Foe to Christianity? By Another Gentleman with a Duster. 119 pages. New York: Frederick Moore, 1923.

Therapeutics of Activity. By Andrew A. Gour, M.G., D.O., Professor of Osteopathic Gymnastics and Orthopedics of the Chicago College of Osteopathy; Formerly Instructor of Medical Gymnastics at the Young Men's Christian Association College, Chicago. 475 pages, illustrated. Chicago: Govici-McGee, 1923. Cloth, $4.00.

Nursery Guide, for Mothers and Nurses. By Louis W. Sauer, M.A., M.D., Senior Attending Pediatrician, Evanston Hospital; Formerly Attending Physician, Chicago Infant Welfare, and Assistant Attending Physician Children's Memorial Hospital, Chicago. With 188 pages, illustrated. St. Louis: C. V. Mosby Co., 1923. Cloth, $1.75.

Southern Medical News

AMERICAN ROENTGEN RAY SOCIETY

The annual meeting of the Eastern Section of the American Roentgen Ray Society will be held at the Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., January 24-26. The program promises to be of unusual interest. A large attendance is anticipated and it is recommended that hotel reservations be made at an early date. Dr. Thos. A. Groover, 1621 Connecticut Avenue, N. W., Washington, D. C., is President.

ALABAMA

At a recent meeting of the Jefferson County Medical Society, Birmingham, Dr. Frederick C. Banting, Toronto, Canada, was the guest of honor, and spoke on his work on insulin.

Dr. Patton K. Pierce, Tuscaloosa, and Miss Helen Hammer, University, Va., were married July 25.

Dr. William Getz Thuss, Birmingham, and Miss Sara Louise Benedict, Nashville, Tenn., were married September 25.

Deaths

Dr. Henry Gaither Perry, Montgomery, aged 63, died suddenly October 9 from heart disease.

Dr. Isaac Fox DeLony, Leighton, aged 95, died September 25 from senility.

Dr. Henry Clay Burnum, Trussville, aged 54, died October 11.

Dr. Joseph Robert Horn, Luverne, aged 63, died September 28 from septicemia.

ARKANSAS

Dr. Morgan Smith, Dean of the University of Arkansas Medical Department, Little Rock, has resigned and will resume private practice. Dr. A. R. Stover will succeed him as Dean.

The Tri-State Medical Society (Arkansas, Louisiana and Texas) will meet in Texarkana December 5-6.

Dr. L. R. Brown, Jackson, Miss., has been elected head of the Arkansas State Hospital for Nervous Diseases, succeeding Dr. C. C. Kirk, Little Rock.

Dr. John E. Marvin Taylor, Sparkman, has been appointed Secretary of the Dallas County Medical Society, succeeding Dr. Claiborne J. March, Fordycke, resigned.

Dr. C. W. Garrison, Little Rock, has been elected State Health Officer for the third successive term. He will hold office until 1927.

Dr. Hison F. Williams, Ozark, has been elected President of the Tenth Councilor District Medical Association.

Deaths

Dr. Joseph L. Burns, Jonesboro, aged 72, died October 15 from cerebral hemorrhage.

Dr. Joseph M. Reynolds, Redfield, aged 76, died October 15 from senility.

Dr. John Luther Kelly, Hope, aged 55, died September 22 following a long illness.

DISTRICT OF COLUMBIA

At the recent annual meeting of the Wapiya (Medicine Men) in Washington, the following officers were elected: Dr. Everett M. Ellison, President; Dr. Oscar B. Hunter, Vice-President; Dr. Frank A. Hornaday, Secretary-Treasurer.

Dr. Ellis Arthur Stephens, Lieutenant, M. C., U. S. Navy, Washington, and Miss Kathleen Curtis, Springfield, Mass., were married at New York October 27.

Deaths

Dr. Kate Dellcourt Barstow, Washington, aged 87, died October 1 from senility.

Dr. Howard M. Hamblin, Washington, aged 76, was found dead September 12 from accidental asphyxiation.

Dr. Edmund Douglas Welch, Washington, aged 27, died September 26 from myocarditis, following influenza.

FLORIDA

The Florida Midland Medical Society held a meeting at Bartow October 24. The following officers were elected: Dr. W. R. Groover, Lakeland, President; Dr. H. K. Murphy, Mulberry, Vice-President for Polk County; Dr. H. P. Bevis, Arcadia, DeSoto County; Dr. A. J. Wood, St. Petersburg, Pinellas County; Dr. J. W. Alsobrook, Plant City, Hillsborough County.

Work on the $75,000 Mound Park Hospital, St. Petersburg, is progressing rapidly.

Dr. Robert Minor Baker and Mrs. Ruby Fornto Jones, both of Jacksonville, were married October 18.

Dr. Hugh Wesley Wade, St. Petersburg, and Mrs. Margaret Leet Beckman, of Altoona, Pa., were married October 29.

Deaths

Dr. Levi Joseph Jenkins, Whitney, aged 59, died recently.

Dr. Robert James McMurray, Sebring, aged 70, died October 7.

GEORGIA

The Georgia Tuberculosis Association, at the annual meeting in Atlanta, October 11, elected Dr. Edwin W. Glidden, Alto, President; Dr. Thomas D. Walker, Jr., Macon, Vice-President.

Drs. M. M. Stapler and H. T. Harris, Macon, have opened a home and school for the deaf.

A health resort to be known as the Blackman Terrace is to be built in Atlanta on Peachtree Road. The building will be four stories high and will contain 75 rooms for guests, a dining room, roof garden, auditorium and gymnasium. One of the conditions of the issuance of the permit was that surgical, alcoholic, narcotic and mental cases should not be treated at the resort. The resort will be opened under the direction of Dr. W. W. Blackman.

Dr. L. I. Lanier announces his removal from Wesley, Ga., to Soperton, Ga.

Dr. B. B. Steedly, Union, S. C., has been appointed Director of the Steiner Memorial Cancer Clinic in Atlanta. Mr. Steiner left $500,000 for the memorial which is under construction on the Grady Hospital grounds.

Deaths

Dr. Arthur Gibbon Kelley, Atlanta, aged 35, died recently of a skull fracture received when struck by an automobile.

Dr. Rebecca C. Wolfe Brannon, Atlanta, aged 63, died September 29 in New York, N. Y., from heart disease.

Dr. John H. Crozier, aged 69, died September 22 from cerebral hemorrhage.

Dr. James Harrison Crawford, Martin, aged 51, died September 22 from appendicitis.

Dr. Thomas E. Arrington, Howard, aged 64, died September 23 from cerebral hemorrhage.

Dr. William Henry Harpe, Cussetta, aged 65, died September 10 from cerebral hemorrhage.

Dr. William M. Haslam, Pinehurst, aged 83, died in September from senility.

KENTUCKY

Hardin County Medical Society has elected Dr. E. W. Montgomery, President; Dr. J. M. English, Vice-President; Dr. D. E. McClure, Secretary-Treasurer.

Dr. David Barrow has arranged with St. Joseph's Hospital, Lexington, to establish a surgical charity service there as a memorial to his son, Woolfolk Barrow, who died at St. Joseph's Hospital from injuries received in an automobile accident. The income from $30,000 will be given to the institution to be expended in caring for patients admitted to this service.

Dr. B. F. Robinson, Berea, has been elected as a member to the Fellowship of American Surgeons.

Dr. A. F. Goodwin, physician for a coal camp in Harlan County, has been appointed railroad surgeon for the Cumberland Division of the L. & N.

Deaths

Dr. Henry Enos Tuley, Louisville, aged 53, died October 21 of heart disease.

Dr. Jacob Clark McCreary, Louisville, aged 60, died October 8 at St. Anthony's Infirmary, following an operation on the gall bladder.

Dr. Joseph Franklin Daugherty, Walton, aged 57, died September 8 of chronic nephritis at a hospital in Cincinnati.

Dr. James R. Paine, Pembroke, aged 77, died September 18 from heart disease.

Dr. Edgar Catterton, Louisville, aged 58, died suddenly November 14.

LOUISIANA

The Tri-State Medical Society (Arkansas, Louisiana and Texas) will meet in Texarkana December 5-6.

Touro Infirmary, New Orleans, announces a series of three-day courses for physicians throughout the Southern states on the use of insulin, with the aid of the John D. Rockefeller, Jr., Insulin Fund. These courses will be free and the number to be admitted to each course will be limited by the facilities. Courses December 10-16 and December 17-19.

Dr. S. L. White, Ruston, was in Birmingham recently visiting the hospitals and clinics of the city, and paid a visit to the Association office.

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Dr. Edmond Souchon and Miss Marie Estoup, both of New Orleans, were married October 25.

Dr. Harry Joseph French, St. Martinsville, and Miss Laulie Guidry, Levert, were married October 30.

Dr. Muir Bradburn and Miss Helen Donald Watson, both of New Orleans, were married October 10.

Deaths

Dr. Silas Youree Alexander, Shreveport, aged 42, died September 25, following an operation for intestinal obstruction.

Dr. James Jordan McCane, New Orleans, aged 63, died October 19.

Dr. Agrippa Gayden, Norwood, aged 70, died recently.

Dr. Sidney Philip Delaup, New Orleans, aged 60, died October 29.

Dr. Ralph Bertrand Raney, Crowley, aged 54, died October 20 from carcinoma.

MARYLAND

Dr. J. Whitridge Williams, for the last thirteen years Dean of the Johns Hopkins Medical School, has resigned and will devote his entire time to the new Women's Clinic of the Johns Hopkins Hospital, of which he is Director. Dr. Lewis Hill Weed has been named as Dean to succeed Dr. Williams.

Dr. Charles V. Akin, Jr., has been appointed head of the Child Hygiene Department, Hagerstown, succeeding Dr. R. B. Norment, Jr., U. S. Public Health Service, who has been ordered to report for duty at the Marine Hospital, Stapleton, N. Y.

Dr. Martin F. Sloan has been elected President of the Tuberculosis Association of Maryland, succeeding Dr. Henry Barton Jacobs, resigned.

Dr. Calcoulon L. Elliott, connected with the New York State Department of Health, has been appointed Epidemiologist to the Baltimore City Health Department.

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